SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

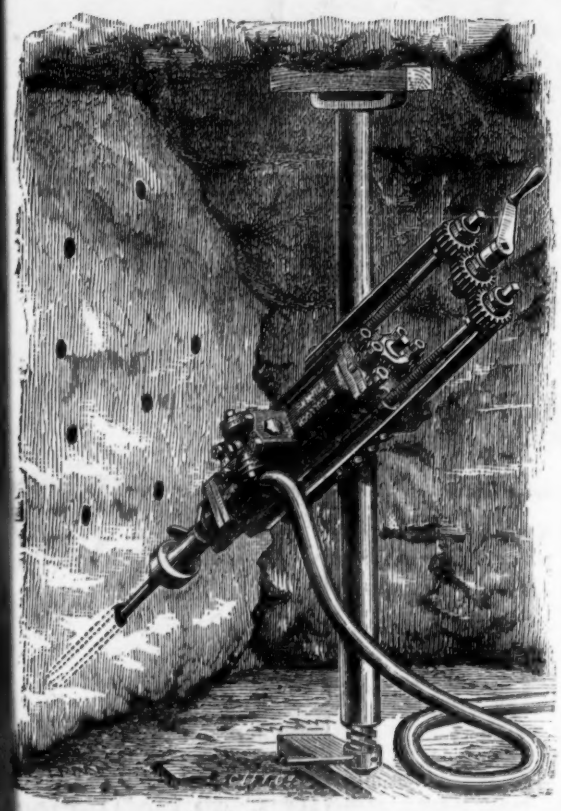
No. 2540.—VOL. LIV. LONDON, SATURDAY, APRIL 26, 1884. PRICE (WITH THE JOURNAL) SIXPENCE BY POST £1 4s. PER ANNUM.

FIRST SILVER MEDAL, ROYAL CORNWALL POLYTECHNIC —Highest Award for Effectiveness in Boring, and Economy in the Consumption of Air

JUBILEE EXHIBITION, 1882.

THE PATENT

"CORNISH" ROCK DRILL.



This Drill has been constructed after a long practical experience to the requirements necessary for Mines, and has more than realised the expectations of its inventors. The chief objects in view were GREATER DURABILITY AND LESS LIABILITY TO DISARRANGEMENT; but it has also proved itself more EFFECTIVE AND ECONOMICAL.

We are now prepared to enter into any reasonable arrangement so as to enable users to judge of its merits, as we are thoroughly convinced that we can offer the BEST ROCK DRILL IN THE MARKET.

Further particulars on application to the Makers—

HOLMAN BROTHERS,
CAMBORNE FOUNDRY AND ENGINE WORKS,
CAMBORNE, CORNWALL.

NEW PATENT

Stone Breakers and Grinding Machinery.

CAUTION TO PURCHASERS.

Do not buy any Stone Breaker or Pulverising Machines until you have seen ours. Price Lists and Testimonials free on application.

A Machine as will break 40 tons per day for £45.

MACHINES LET OUT ON HIRE, OR ON THE HIRE SYSTEM.

Apply S. MASON and Co.,
STONE MACHINE WORKS, LEICESTER, ENGLAND.

MACHINES MADE WITH SECTIONAL FACED JAWS, OR ANY OTHER.

SOLID DRAWN BRASS AND COPPER BOILER TUBES

FOR LOCOMOTIVE OR MARINE BOILERS

EITHER

MUNTZ'S OR GREEN'S PROCESS

MUNTZ'S METAL COMPANY (LIMITED),
FRENCH WALLS,
NEAR BIRMINGHAM.

LONDON AGENTS—CHARLES MOSS and Co., 2, Rood Lane, London, E.C.

PATENT IMPROVED

"INGERSOLL ROCK DRILL."

MEDALS AND HIGHEST AWARDS

SEVEN YEARS IN SUCCESSION,

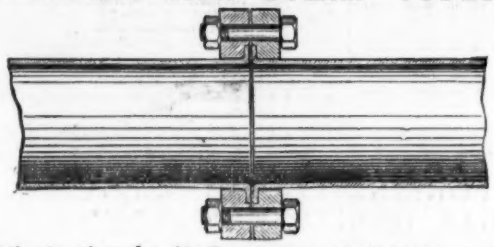
FOUR IN ONE YEAR.

American Institute, 1872.
American Institute, 1873.
London International Exhibition, 1874.
Manchester Scientific Society, 1875.
Leeds Exhibition, 1875.
Royal Cornwall Polytechnic, 1875.
Rio de Janeiro Exhibition, 1875.
Australia Brisbane Exhibition, 1876.
Philadelphia Exhibition, 1876.
Royal Cornwall Polytechnic, 1877.
Mining Institute of Cornwall, 1877.
Paris Exhibition, 1878.

AWARDED FOR

SIMPLICITY in CONSTRUCTION.
AUTOMATIC FEED
(Perfect success)
GREAT STEADINESS.
GREAT POWER.
GREAT DURABILITY.
GREAT EFFECTIVENESS.

WROUGHT-IRON STEAM TUBES.



Estimates given for Air Compressors and all kinds of Mining Machinery. For Illustrated Catalogues, Price Lists, Testimonials, &c., send to—

LE GROS, MAYNE, LEAVER, & CO.
60, Queen Victoria Street, London, E.C.

MACDERMOTT AND GLOVER'S PATENT

PERCUSSIVE ROCK PERFORATOR

(IMPROVED)

FOR HAND-LABOUR ONLY,

IN HARD ROCK.

FOR MINES, QUARRIES, AND GOVERNMENT CONTRACT WORK.

RATE OF PENETRATION IN GRANITE,
1½ to 2 inches per minute.

Price £50 complete.

For full particulars, apply to

GLOVER & HOBSON,
ENGINEERS & MILLWRIGHTS,
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SOLE MANUFACTURERS; OR TO—

M. MACDERMOTT, 25 and 26, Pudding Lane, London.

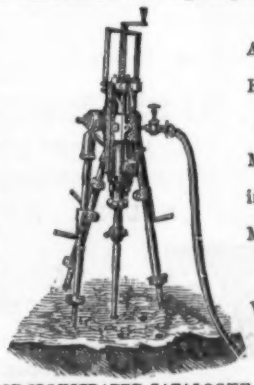
N.B.—A machine can always be seen at work (without notice) at the Albert Ironworks. [TELEPHONE 4664.]

THE PATENT

"ECLIPSE" ROCK-DRILL AND "RELIANCE AIR-COMPRESSOR."

First Silver Medal awarded at Boring Competition, East Pool Mine, Sept. 1883.

SILVER MEDEL—PARIS, 1878—HIGHEST AWARD



Are NOW SUPPLIED to the ENGLISH, FOREIGN, and COLONIAL GOVERNMENTS, and are also IN USE in a number of the largest MINES, RAILWAYS, QUARRIES, and HARBOUR WORKS in GREAT BRITAIN and ABROAD.

FOR ILLUSTRATED CATALOGUE AND PRICES, apply to—
HATHORN & CO., 22, Charing Cross, London, S.W.

AIR COMPRESSORS,

With R. SCHRAM'S Patent Inlet and Outlet Valves.

BOILERS, TURBINES.

SCHRAM IMPROVED PATENT

ROCK DRILL.

1500 in Use in all Parts of the World.

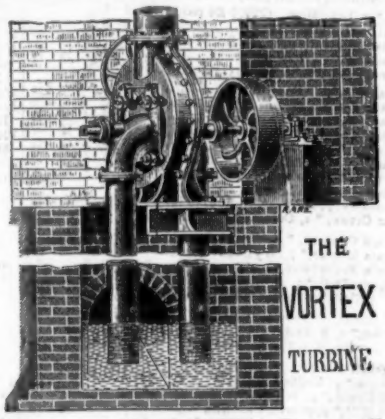
Complete Rock Boring Plants of the most approved construction for Railway Tunnels, Quarries, Shaft Sinking, Level Driving, Stoping, and Submarine Blasting.

All Kinds of Mining Machinery.

ESTIMATES AND FULL PARTICULARS ON APPLICATION.

RICHARD SCHRAM & CO.,
9, NORTHUMBERLAND STREET, CHARING CROSS, LONDON.

GILBERT GILKES & CO.,
KENDAL, ENGLAND,
LATE
WILLIAMSON BROS.



THE VORTEX TURBINE

A most efficient means of applying Water Power to all kinds of Machinery.

Largely used in DRIVING AIR COMPRESSORS, PUMPING, WORKING ORE-CRUSHING MACHINERY, and for other purposes in connection with MINING.

Successfully used in ELECTRIC LIGHTING, and in utilising DISTANT WATER POWER by means of ELECTRICITY.

A Pamphlet containing a full description of the Vortex, with several Illustrations and a number of Testimonials, can be obtained on application.

"THE PATENT ACCESSIBLE"

CENTRIFUGAL PUMP

Is the only Pump from which the disc can be removed by breaking the joint on a single face only.

Manufactured by CHARLES L. HETT,
HYDRAULIC ENGINEER,
Maker of
IMPROVED CENTRE VENT TURBIN WATER WHEELS.
Horse, Steam and Wind Power PUMPS.

Catalogues on Application.

ANCHOLME FOUNDRY, BRIGG, ENGLAND.

Pumping Engines for Mines, Water Works, Sewage Works, and General Purposes.

CAATLOGUES ON APPLICATION.

PUMPING & MINING MACHINERY.

HATHORN, DAVEY, & CO., LEEDS.

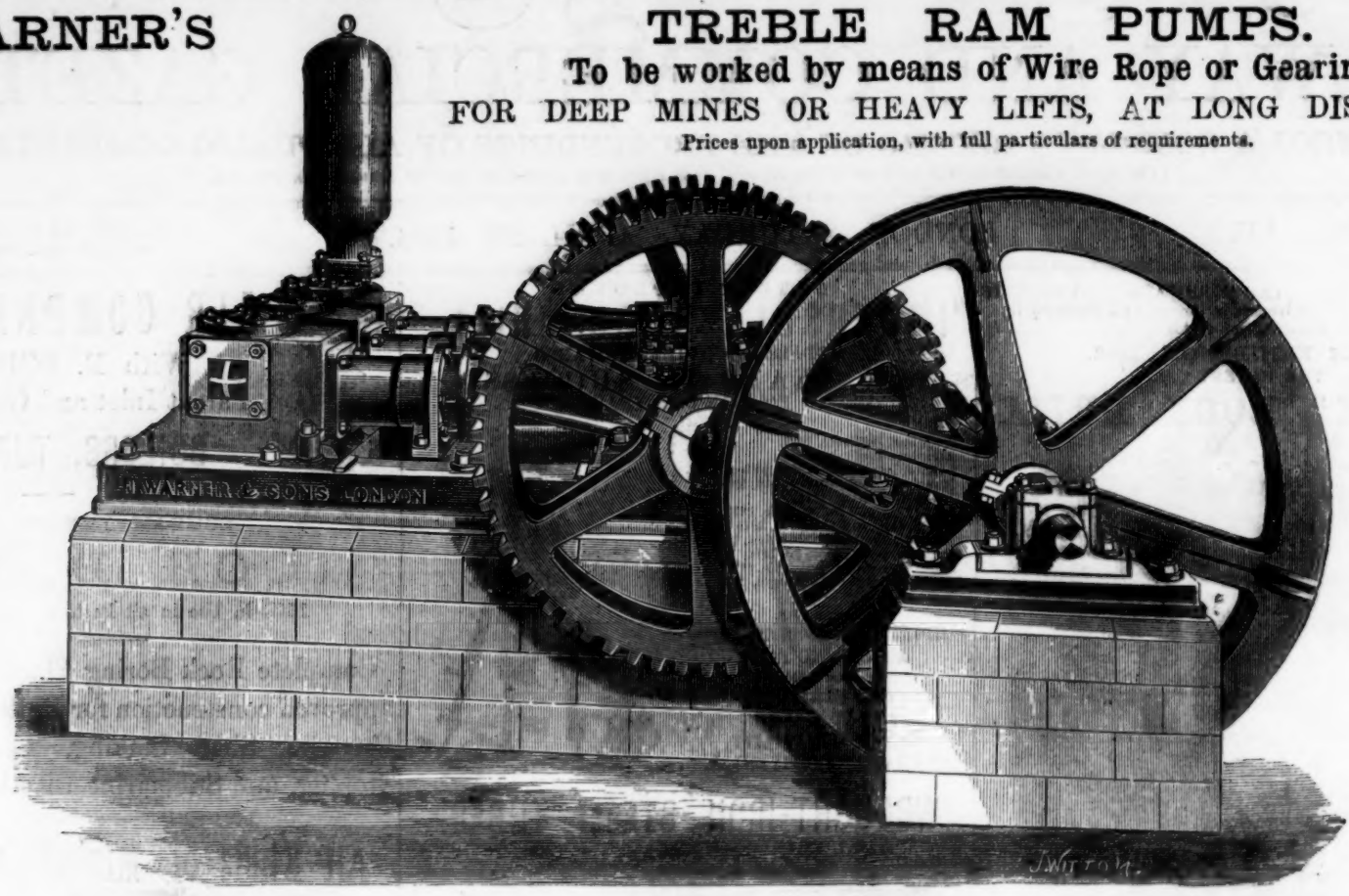
Hydraulic Pumps.
Winding Engines.
Air Compressors.
Man Engines,
Capstans,
&c., &c.

WARNER'S TREBLE RAM PUMPS.

To be worked by means of Wire Rope or Gearing.

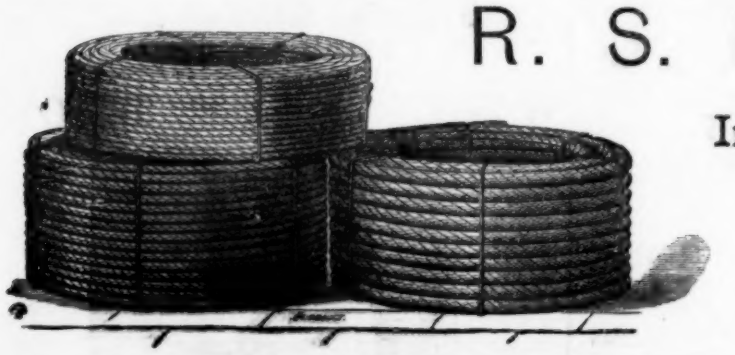
FOR DEEP MINES OR HEAVY LIFTS, AT LONG DISTANCES.

Prices upon application, with full particulars of requirements.



As supplied to Messrs BOWES, of Springwell Colliery, Gateshead, for a Lift of (600) Six hundred feet vertical through two miles of pipes.

JOHN WARNER AND SONS, THE CRESCENT FOUNDRY, CRIPPLEGATE, LONDON, E.C.



R. S. NEWALL AND CO.,

Sole Patentees of Untwisted Wire Rope.

Iron & Steel Ropes of the highest quality for Collieries, Railways, Suspension Bridges, &c.

PATENT STEEL FLEXIBLE ROPES AND HAWSERS.

IRON STEEL, AND COPPER CORDS. LIGHTNING CONDUCTORS.

COPPER CABLES of high Conductivity for Electric Light and Power.

London: 130, STRAND, W.C. Liverpool: 7, NEW QUAY.
Glasgow: 68, ANDERSTON QUAY.
MANUFACTORY: GATESHEAD-ON-TYNE.

PERFORATED SHEET METALS

FOR

TIN, LEAD AND COPPER MINES,

MILLERS, BREWERS, AND MALSTERS,
COLLIERIES AND QUARRIES,
COFFEE ROASTERS AND SUGAR REFINERS.

ALDRED & CO.,

WORKS: PARKER STREET, ASHLEY LANE, MANCHESTER

INCREASED VALUE OF WATER-POWER.

MacADAM'S VARIABLE TURBINE.

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

These Turbines are at work in nearly every county in England. Apply to—

MacADAM BROTHERS AND CO., BELFAST.

BRAUN AND BLOEM'S

CELEBRATED

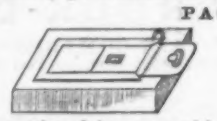
DETONATORS—"EAGLE" BRAND.

TRADE MARK.

The most powerful Percussion Caps for exploding Dynamite, developing its fullest strength.

PACKED IN THEIR PATENT TIN BOXES.

PATENT No. 3665.



A new invention, doing away with the very dangerous operation generally in use of inserting cutting tools when it is necessary to open the outer tin box.

Sold by WM. BRODERSEN, 79, Leadenhall-street, London, E.C.

SOLE AGENT FOR THE UNITED KINGDOM AND THE COLONIES.

TUBES

SILVER MEDAL (HIGHEST AWARD) MELBOURNE, 1881.

JOHN SPENCER,

Globe Tube Works, WEDNESBURY,

AND 3, QUEEN STREET PLACE, CANNON STREET, LONDON, E.C.

FIRST PRIZE, SYDNEY, 1880.

TUBES AND FITTINGS for Gas, Steam, and Water; Galvanised, Enamelled, and Hydraulic Tubes; Boiler Tubes and Fittings; Gas Fitters' Tools; Brass Cocks, &c.

ANTI-CORRODO TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS

R. HUDSON'S

Patent Steel Trucks, Points and Crossings,

PORTABLE RAILWAY, STEEL BUCKETS, &c., &c.

Telephone No. 14.
In connection with the Leeds Exchange, and all the principal Hotels and places of business in the town.

GILDERSOME FOUNDRY, NEAR LEEDS.

(Near Gildersome Station, G.N.R. Main Line, Bradford to Wakefield and London, via Laisterdyke and Ardsley Junctions.)

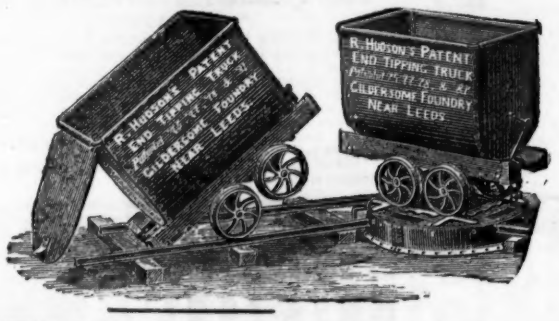
Registered Telegraphic Address:—"GILDERSOME, LEEDS."
A. B. C. Code used.

UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the LIGHTEST, STRONGEST, and most CAPACIOUS made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

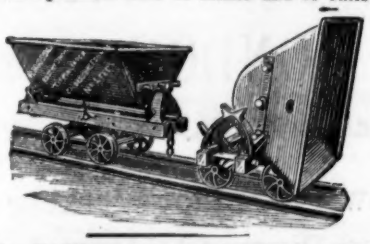
Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.
N.B:—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

1.—PATENT STEEL END TIP WAGONS.

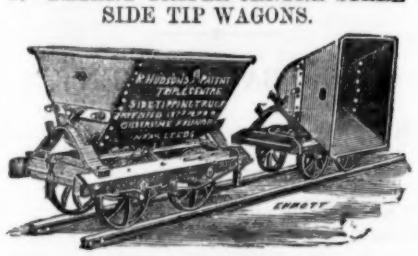


2. PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK,
Will tip either SIDE or either END of rails.



One man can EASILY tip ANY WEIGHT in these wagons.

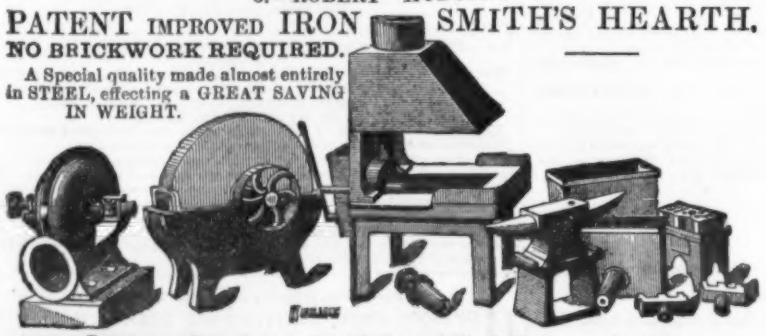
3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



4. -PATENT STEEL PLATFORM OR SUGAR CANE WAGON.

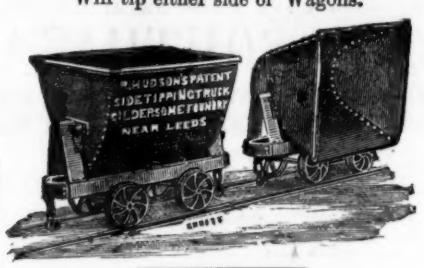
5.—PATENT STEEL CASK.
As supplied to H.M. War Office for the late war in Egypt).
DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight.
(Made from 10 gals. capacity UPWARDS to any desired size.)

6.—ROBERT HUDSON'S
PATENT IMPROVED IRON SMITH'S HEARTH.
NO BRICKWORK REQUIRED.
A Special quality made almost entirely in STEEL, effecting a GREAT SAVING IN WEIGHT.

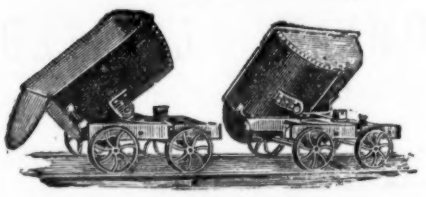


Large numbers in use by all the principal Engineers in this country and abroad.

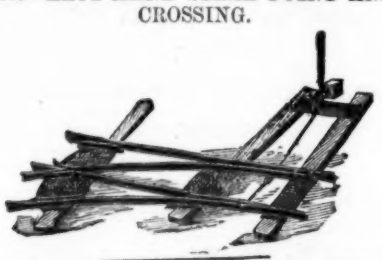
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS,
Will tip either side of Wagons.



9.—PATENT STEEL ALL-ROUND TIP WAGON.

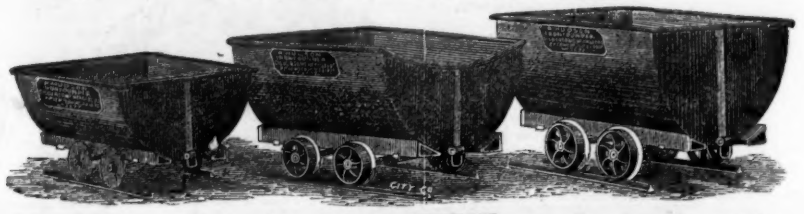


10.—LEFT-HAND STEEL POINT AND CROSSING.

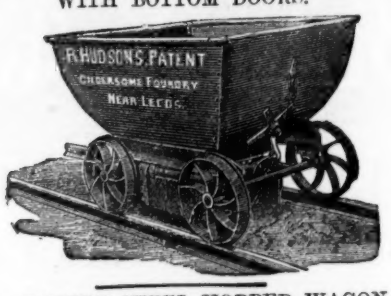


11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.

7.—PATENT STEEL MINING WAGONS.



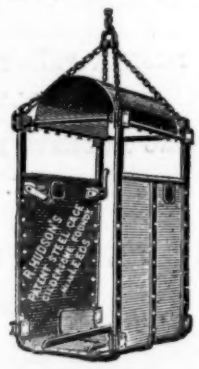
12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.



13.—PATENT STEEL HOPPER WAGON.

14.—SELF-RIGHTING STEEL TIP BUCKET.
(The "CATCH" can also be made SELF-ACTING if desired.)

15.—STEEL CAGE.



16.—PATENT STEEL WHEELBARROWS.
Made to any Size.
Lightest and Strongest in the Market.

A great success.

17.—STEEL SELF-CONTAINED TURNTABLE.

(Also made in CAST Iron for use where weight is not a consideration.

18.—"AERIAL" STEEL WINDING TUB.

Largely employed in the South African Diamond Fields.

No. 19.—PATENT STEEL CHARGING BARROW,
DOUBLE the STRENGTH & much LIGHTER than ordinary Barrows

ALL KINDS OF BOLTS NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES

BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING, for High Pressure Engines. This Packing has been specially designed to overcome the difficulties experienced by engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the construction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realised unless the Packings are so constructed as to avoid stoppages for the purpose of re-packing the stuffing boxes. It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. This Packing has met with the most unqualified approval wherever it has been used, and on being taken out after about twelve months, working at 70 lb. pressure, it has been found to be in a perfect state of preservation, and was therefore replaced. The Patent Block Packing is square, as Fig. 1, and Figs. 2 and 3 represent the Round Block Packing with solid and hollow rubber core, and Fig. 4 without core, but with rubber inlaid. An Engineer writes as follows:—"The Asbestos Block Packing works splendidly. I have never seen its equal. We keep our gland nuts so that you can move them with finger and thumb, and can maintain a constant vacuum of 23½ in." As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, users are requested to see that the packing supplied to them bears my trade mark.

TRADE MARK.

The goods of this house are of the highest quality only, and no attempt is made to compete with other manufacturers by the supply of inferior materials at low prices. All orders must be sent direct to the undermentioned depôts and not through Agents or Factors.

BELL'S ASBESTOS BOILER PRESERVATIVE. This useful mixture by absorbing the free oxygen that is in the water entirely checks pitting and corrosion. It also disintegrates incrustation so immediately as to prevent its adhering to the plates. Not only is a great economy of fuel effected by keeping boilers clean, but the risk of having the plates burned is thereby obviated. It has been computed that 1/16 in. thick of incrustation causes a waste of 15 per cent. of coal; ⅛ in., 60 per cent.; ¼ in., 150 per cent. Thus the Preservative avoids the great risks which are inseparable from scaled plates, lengthens the life of a boiler and covers its own cost a hundred-fold by economy of fuel. It is entirely harmless, and has no injurious action on metals. It can be put into the feed tank or boiler, as may be most convenient. Sold in drums and casks bearing the Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING

for Locomotives, and all Stationary Engines running at very high speed with intense friction.

The following Testimonial refers to this Packing:—

Festiniog Railway, Locomotive Superintendent's Office,
Portmadoc, January 13, 1883.

Mr. John Bell, 118, Southwark-street, S.E.

DEAR SIR,

I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed, better than we expected. We have a locomotive packed with it, which has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting Packing. The Asbestos Yarn we find is very useful, and answers admirably.

Yours truly,
(Signed) W. WILLIAMS.

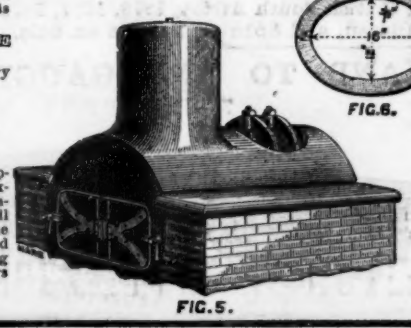


FIG. 5.

FIG. 6.

FIG. 1.

FIG. 2.

FIG. 4.

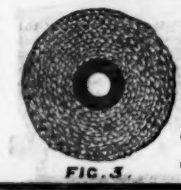


FIG. 3.

BELL'S ASBESTOS BOILER AND PIPE COVERING COMPOSITION, for coating every class of steam pipes and boilers, non-combustible and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is absolutely indestructible. It can be stripped off after many years' use, mixed up with 20 per cent. of fresh, and applied again. The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

A Horizontal Boiler, 17 ft. 6 in. long, 15-H.P., gave the following results:—

Temperature on Plates - - - 186 deg.
" " Covering - - 94 deg.

One ton of coal was saved per week, and although the fire was raked out every evening, 20 lbs. of steam were found in the boiler next morning.

The following Testimonial refers to this Covering:—

Offices of the Wimbledon Local Board, Wimbledon,
Nov. 28th, 1883.

DEAR SIR,—It may interest you to know that we save exactly 48 per cent. in fuel through using your covering.—Yours truly,
W. SANTO CRIMP, C.E., F.G.S.

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(Sig.) SIEGFRIED, Colonel."

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Original Correspondence.

WEST AFRICAN GOLD MINES—NECESSARY REQUIREMENTS FOR DEVELOPING—No. II.

SIR,—It does, indeed, seem a farce that in a country like this, in which Nature has been so prolific, that the whole of the staple commodity of food required to feed the labour employed—rice—should have to be imported in thousands of tons yearly, when it could be produced in the country at a less cost than the freightage, duty, and transport amounts to. It must be borne in mind that this is a young colony, with a great future before it, and requires a little fostering care; and as in this part of it gold mining is the only industry, it becomes necessary that economy be considered in its development, and that no precipitate action be taken without due consideration. That the gold exists in payable quantities by being economically worked with proper appliances, is proven beyond a doubt; but any further expenditure of money on the past and present system of working is only like throwing the money into the sea. The first and great consideration of all parties interested in the gold mines of the Tacquah district is to reduce the cost of transport of stores and machinery to a maximum of 6*l*. per ton, and to get a class of machinery and appliances on the mines, by which 75 per cent. of the gross assay of the ore can be obtained at a maximum cost of 15s. per ton, and this only can be accomplished by a tramroad being made from Axim to Tacquah, or otherwise a road that vehicles can be worked on.

Secondly, the class of machinery. "Honour to whom honour is due" is an old adage; it never was more applicable or merited than when applied to the managers of the three companies previously mentioned. They have succeeded by indomitable energy and perseverance, in the face of what must have appeared almost insurmountable difficulties, in transporting machinery into the interior of this country and erecting it on the mines. With it they have proved beyond a doubt that the gold actually exists. Having done so that machinery has served its purpose; for treating ore in large quantities at an economical cost it is absolutely useless. The British public have not the remotest idea of the difficulties to be contended with in transporting machinery through a country like this, without roads other than tracks cut through the dense forest and jungle, without bridges, over innumerable small creeks, over precipitous ridges and miles of swamps, without beasts of burden or vehicles of any description, with nothing but men's heads to pack either pieces of machinery or cases of stores, with a people that will produce nothing, consequently solely dependent on the supply of provisions from Europe, it is almost incredible that those gentlemen have accomplished what they have. But the public are apt to say, having accomplished so much, how is it there are no dividends forthcoming? The question is easily answered. Say, for instance, the ore would yield an average by assay of 2 ozs. per ton (and that is a very exceptional average, although I am confident from my own prospecting there are thousands of tons of ore to be obtained in the mines of the Tacquah district that would yield that average) the class of machinery there at the present time will not save more than 30 per cent. of that 2 ozs., (say) about 12 dwts. per ton, worth at the rate of 4*l*. per ounce, 2*l*. 8s. Every ton of that ore costs fully 25s. to crush it, and 20s. more to break it in the mine and convey it to the mill, that is 2*l*. 5s. per ton, leaving only 3s. per ton for wear and tear (which is considerable on one of these small mills), expenses attached to removing tailings, making dams for conservation of water and other incidental expenses. Where is the dividend to come from? And it must be borne in mind that 2 ozs. per ton is a very large average; at 1 oz. per ton the mine could only be worked at a loss.

Another thing that must be borne in mind is that quartz crushing machinery is different from any other machinery. To be packed, as it has been done, on men's heads it necessarily requires to be in small pieces, that have to be bolted together; the constant jar and vibration caused by the stamps, assisted by the rust, soon loosens these bolts, and the result is a continual series of stoppages (almost daily) for repairs, which occasions extra expense. Again, the public are apt to say, how is it that a large mill can be worked at so much less a cost than a small one? First, there is a greater economy of fuel with large boilers than with small portable ones; secondly, the labour expenses of driving an engine that will crush 50 tons per week s the same as an engine that will crush 500 tons, and the same with regard to amalgamation; lastly, that by having plenty of steam-power it can be utilised to make everything possible work automatically, thereby saving a large outlay for manual labour. Thus, a battery that would reduce 50 tons of ore per week could not be worked on the most economical scale for less than 30*l*. per week working expenses, or at the rate of 12s. per ton, not including stoppages, whereas a mill that would reduce 200 tons per week can be worked for 80*l*., or at the rate of 8s. per ton. In these estimates I am quoting Australian rates of wages. Quartz mining is a new industry in West Africa, and things have not yet got settled into proper working order, but one thing is certain, it will never be remunerative until it is worked by a proper system, the same as any other business; and that system is that a manager of a mine reports that according to the class of machinery he has to work with he can reduce the ore at (say) 10s. per ton; that he can break that ore (according to the size of the lode and the nature of the country, whether hard or soft) at (say) 15s. per ton; incidental expenses connected with the general working of the company (say) 5s. per ton: total, 30s. per ton. That he estimates the ore to yield an average of (say) ½ oz. per ton, worth (say) 2*l*.; thus leaving a clear profit of 10s. per ton on every ton of ore he puts through the mill. If a manager makes such a report, and fails to fulfil what he has stated, he at once proves to the company he represents his incapacity as a mining manager of estimating the cost of the work he has undertaken to perform, or his want of judgment in prospecting the ore to form a correct estimate of the probable average yield per ton; or otherwise, that he has been misleading the company by false representations. The greatest possible mistake that a mining manager can make is to over estimate the yield of ore in his reports, for shareholders at once commence to calculate the dividends that will accrue according to that yield, and are greatly dissatisfied if it falls short, whereas if the yield exceeds the estimate they have the pleasure of receiving a larger dividend than they anticipated. Another great difficulty to be contended with here is the class of gold; it is unquestionably the finest gold that has come under my observation during 22 years mining experience—that is to say for free gold, or gold not in combination with pyrites.

From experiments I have made I have discovered that fully 50 per cent. of the gold in these ores goes away in the water from the mill; its density is so light it cannot precipitate itself through the water to come into contact with the copper plates, and the mischief is that this gold is not deposited with the tailings, but goes away with the water. The experiments I have made have been from samples taken from the slime at the Gold Coast Company's property at Abbontuyakoon, where the water after leaving the mill spreads over a large area of flat ground that is a swamp in the wet season, but at the present time dry; the sun has evaporated the water, and left a deposit of slime all over the surface of the ground. The prospects obtainable from this slime are almost incredible, one sample giving a yield of 45 ozs. per ton, and none less than 2 ozs. Now the subject for consideration is how to save this gold or a large percentage of it.

The best method would be to reduce the ore by a dry process without the ore being subjected to the action of water at all, but unfortunately dry processes are very expensive, and the cost of treatment might absorb the whole of the yield. Paul's dry process of San Francisco is one of the best, calculated to save 80 per cent. of gross assay, but treatment by that process would cost from 30s. to 40s. per ton. Such a process is not adapted for treating low class ores, and the maximum average yield of the ores of the West African mines cannot be calculated above 1 oz. per ton. But it is the immense quantity of it, and so easily worked, that is the great advantage in these mines. There are also other dry processes of which I cannot speak authoritatively as to the working cost or adaptability for reducing this class of ore, but will do so at some future time after obtaining more complete information with regard to them. But leaving aside the question of dry crushing, with a properly constructed mill fitted with the latest appliances for grinding and concentrating, 75 per cent. of the gross assay of the ore can be obtained at a cost of 15s. per ton—that is, 8s. per ton for reducing and 7s. per ton for grinding the tailings. Such a mill would consist of (say) 20 or 40 head (according to the output of ore) of 1100 lb. stamps, with stone-breaker and self-feeding apparatus, each box to contain five stamps, and running them with 12 in. drop at 70 revolutions a minute, to be fitted with punched steel screens 256 holes to the inch, and delivering over not less than 8 ft. of copper plates, with three treble mercury wells; the discharge from the plates to go into two Brown and Stansfield's concentrators (the best concentrating appliance in use at the present time), the concentrated ore to be discharged into two Wheeler's pans for grinding, the overflow from the Wheeler's pans to go into two Berdan pans for amalgamating, the overflow from the Berdan pans to go into a settler, also the overflow from the concentrators to be diverted into two Berdan pans, the overflow from which also goes into the settler, everything to work automatically from the time the ore is delivered into the hopper of the stonebreaker; with such an appliance 75 per cent. of the gold in the ore would be obtained at a cost of about 15s. per ton. Each battery of five head of stamps would reduce about 100 tons of ore per week. If the West African gold mines are to be a success this is the class of machinery that must be introduced for working them; with it they will pay handsome dividends, without it they will never repay the shareholders the money already expended.

THOS. J. HAUGHTON, M.E.,
Axim, West Africa, March 7. Mining Engineer and Assayer.

WEST AFRICAN GOLD COAST—MR. HAUGHTON'S PROPOSED ROAD.

SIR,—It is to be hoped that Mr. Haughton's suggestion as to the making of a road from Axim to Tacquah may not be allowed by those interested in the welfare of the Colony to fall to the ground. That such a road, I say nothing about a tramroad, that would come, no doubt, afterwards, is absolutely necessary to the proper and quick development of the resources of the Colony now, as all acquainted with the country can for a moment doubt. But it is not likely the Government will take the initiative; the matter must be brought, therefore, under their notice. I would suggest then that a deputation be formed, as influential a one as possible formed, we will say, of those who know the country well and its requirements, and those who are connected with some of the leading industries. Captain Cameron, for example, Mr. Haughton himself, if at home, some of the directors of the various gold-mining companies, and the like. Let such a deputation ask for an interview with the proper Government official, and if obtained lay before him the urgent need of the road, the impetus it would give to commerce, the consequent increase of revenue, the small cost of making it, and such other facts as might suggest themselves; or failing a deputation, and to prepare the way for one, a statement embodying the above facts might be forwarded to the proper quarter.

To adopt either of these two courses would cost but little time or money, and the gain might be great. If the matter could be discussed by the directors of any of the present mining companies, and a statement drawn up by them, it could very easily be sent round to the other companies and signed, and then be forwarded to the Colonial Office.—*Somerton, Norfolk.* J. BUDD.

ON THE GOLD FIELDS OF THE WYNAAD, IN THE PRESIDENCY OF MADRAS, INDIA.

SIR,—In consequence of its visibility, by reason of colour and disemination over, and closely beneath, the surface of the earth, gold was probably the first metal that mankind came in contact with; and in India, as in every other country, where it exists, the most abundant and manifest demonstrations were consequently discovered by their original inhabitants, or by succeeding generations before our time. Thus we may fairly presume that most of the surface gold fields of all thickly inhabited countries have already been ransacked in search of it. Such, then, is the case of the region I here describe, and upon which much capital has been expended during the last five years on worn-out "hill diggings," which were formerly worked by tyrant Rajahs, who ruled India in detail before the advent of the East India Company. They compelled their unhappy slaves to labour for a small daily pittance of rice or raggi, and who on the slightest deficiency in quantity of gold to be delivered were visited with unmerciful floggings and torture by pressing their limbs in a kind of vice, often crippling them for life, as a warning to stimulate their fellow slaves; and this system of forced labour was continued to the time of Tippoo Sultan, who impaled them for like motives. These are the local traditions transmitted to their descendants. Can we then wonder that the present generation withhold any information they possess respecting past statistics when moved by doubts or fears that they may again be subjected in any degree to their former toils and sufferings? But the practised eye easily detects that these alluvium depositions have been turned over and over in a systematic manner to a necessary depth by multitudes who have washed and sluiced them. And from virgin patches that have accidentally escaped their manipulations we can conclude that tons of gold were extracted and dispersed over India, exciting the cupidity of Persian and Afghan invaders, who lived in elevations above the levels, where only the prized metal abounds, despoiling the weaker tyrants of their accumulated and ill-gotten wealth. And thus in the year A.D. 1293 Alláhúdin, afterwards Emperor of Delhi, received as ransom on raising the siege of the city 15,000 lbs. of pure gold. And Tippoo Sultan paid to Lord Cornwallis an amount equal to 3,300,000*l*.; and hosts of other fines and spoilations are chronicled.

The precious metal is found in most countries dispersed with alluvial gravels, and which removed from their original birth places, the worn-down mountains having been disintegrated and shifted by changes in the temperature and gradual action of water and time, since the creation of the world—"once without form and void." These depositions from the mountains follow down the courses of rivers to the sea, forming the tablelands on which we live, and recent explorations beneath similar depositions in the United States of North America prove that whole ranges of mountains have been disintegrated there as elsewhere, which were formerly several miles higher than they at present are, converted by natural laws to form the great plains of the Western States, as directly underneath first depositions ancient beds of rivers have been unearthed to depths of from 200 to 600 ft., and these intersected above by other old water-courses buried in succession by the debris of worn-down mountains, and by following up these beds of rivers gold is found disseminated throughout the cemented alluvium in considerable quantities above them, and is extracted by attacking the face of the conglomerate by the aid of hydraulic force, or application of a stream of water brought by canals from a great distance to an elevated point, and conducted through 3-in. nozzle pipes playing against the alluvium at a pressure of from 40 to nearly 200 lbs. per square inch, the materials worked upon having been previously lifted and loosened by driving a T-tunnel in it (when necessary) to a length of about 70 ft., and exploding at the ends on either side a necessary quantity of dynamite blocked in with masonry, the disintegrated soil falling into a sluice or wooden canal, lined at the bottom with blocks of wood on ends and having great declivity, and is carried onward and downwards by the force and quantity of water employed, and the gold in transit is trapped and amalgamated with quicksilver, which lies at the bottom throughout the length of the wooden canal, the huge boulders which are dislodged rolling with it pulverising the material and disengaging the gold, the larger boulders being detained at the foot of the work to prevent the destruction of the wooden canals, the richer part of the conglomerate being found in the blue lead, which lies contiguous to the bed-rock in the lowest abandoned river bed, deposited there by its greater specific gravity. This kind of deposit should be termed hill diggings, in distinction from technical or legitimate mining on deep lodes, as occurs of copper and silver. Thus the Wynaad gold fields are only diggings, and of a smaller character to those of Peru, in South America, or California, in the United States of North America, which lie over valleys of erosion, gigantic channels of ancient rivers, with hundreds of feet of cemented alluvial conglomerate above them as described. The auriferous district of the Wynaad has an elevation of from 3000 to 4000 ft. above the sea-level, with origination in the Nilghiri hills, which have an approximate mean height of 7400 ft., and an area of about 400 square miles, and on the breasts and lodgments around above, and beneath the town of Devala various mining companies have been unsuccessfully operating during the last five years, as the diggings have been exhausted, and no true fissure lodes exist. The average thickness of the alluvium on which the ancient miner worked can be accurately measured in the hundreds of circular perpendicular shafts which still remain intact without any timbering, worked through the tenacious laterite down to the hard gneiss bed-rock, and located sometimes not 6 ft. apart to a depth of 40 or more feet, and about 3 ft. in diameter. Such perforations are found in the diggings of the ancient Incas of Peru, in search of grain and nugget gold at the bottoms of these shafts, in lodgments and cavities, and are termed in mining parlance "pots and finds." Thus in Peru, as in California, as much as 8000*l*. in value have been extracted at the bottom, and within the orbit of a single shaft. Sometimes they mined also between the layers or beds of quartz, which repose and follow down the breasts of the hills parallel with their exterior lines, embedded in alluvium. But these crystalline casements are not lodes, being termed by Spanish miners in South America, where they frequently occur, "Mantos de pellejo," as they dip down, but not into the hill, and are despised as generally worthless, and always considered as superficial stratifications of no durability. The contiguity of these shafts in the Wynaad, as elsewhere, can be accounted for by the eagerness of the slave to deliver his quantum of gold from fear of punishment, locating the new sinking as near as possible to the one of his successful neighbour who had fallen upon a pot or find, as each slave worked independently of his fellow-slave. The gold in the Wynaad is found in very minute particles dispersed throughout the alluvium, and is generally invisible without the aid of a magnifying glass, but at lower levels (say) of 2000 ft. above the sea richer depositions over smaller areas have probably been met with; those of the Wynaad being elevated depositions on auxliary lines of drainage, and the seams or mantles of quartz have been formed by aqueous agency, from the disentegrations of which they are composed, percolating and intruding themselves during centuries into the alluvium which lie both under and over the silications. The presence of the salts of iron, and other salts which are attracted by affinity to the material being the cementing auxiliary agent to form the crystalline layers of quartz which lie here in pairs over each other, and at short distances apart parallel with the slopes of the hills in which they are situated, causing also the patches of pyrites which exist in small quantities in the quartz.

But these reefs or mantles as mined and broken up by the mining companies do not contain one grain of gold per ton, but the lumps of pyrites when picked out from the mass of quartz, are thus raised to 4 dwts. of gold per ton for pulverisation and amalgamation; but upon this stuff the ancient miner did not waste his labour, as despising the hard and barren quartz mingled with sulphurets, he extracted only the richer concreted alluvium from between the mantles of quartz, and from many samples and repeated assays on small remains of virgin ground I find that this concrete contained on average 8½ dwts. of free gold per ton, and that he used chiefly the broken quartz to support the roof of his workings as pillars, breaking it down only when the distances between the seams of quartz were too narrow to admit his passage forward. He also drove tunnels into his lowest galleries to empty and drain them during the monsoons. And so skilfully and cunningly has he selected the locality of richest depositions, and extracted them without puzzling his mind over geological theories, but contenting himself with the trite and useful aphorism—"Where it is, there it is"—leaving us everywhere in the Wynaad the empty shell, and nothing has yet been discovered by any of the companies in payable quantities, and judging from the present small diameters of the ancient shafts I should consider them to be above 100 years old, as perforations in the earth in sound ground diminish by age, and that their original dimensions were about 4 ft. in diameter.

Gold can be traced in the beds of all the rivers from the Wynaad to the sea beach of Calicut, and the length of the ranges of hills that produce the auriferous depositions may be estimated at 50 miles, with 10 miles of width, and the native Kuroombar will find gold in paying quantities to cover his small wage of 5d. per day in places below the level of the Wynaad, guided by his own knowledge of suitable localities, using his own appliances and traditional methods; but foreign expeditions, with expensive staff of officers and miners, costly machinery, in an unhealthy climate, before reliable reefs or deposits have been recognised, can only end in failure. Our future supplies of gold will chiefly result from deep mining in North America and republics on western coast of South America, on lodes of silver in alloy with gold; and the concentrated proportion of those metals on the Comstock lode and Northern States of Mexico is 45 per cent. gold, with 55 in silver, and which is about the same as produced in the recently famous mines of Montana.

Fenchurch-street, April 22. GEORGE O'BRIEN.

THE PEOPLE'S GEOLOGICAL OR MINERALOGICAL GARDEN.

SIR,—What the geographical garden or "Cosmos" is to the animal and the plant (the fauna and the flora), so is the geological or mineralogical garden to the fossil, the rock, the mineral, and the metal, &c. It is their associated homes or habitats precisely as they are found in Nature, and precisely as the animal and the plant are placed in the geographical garden. Scientific museums cannot give the essential environments which these scientific gardens actually give, and to the millions are, therefore, utterly unintelligible.

Fulham, April 19. AUGUSTUS J. HARVEY.

MINING ENTERPRISE IN MEXICO.

SIR,—It may be interesting to your readers who are taking an interest in Mexico to hear that capitalists in San Francisco are selling their Nevada and Colorado properties with a view of purchasing properties in Mexico. I had this upon the authority of a gentleman who has just left that city. They understand the value of silver mines, and if they consider the Mexican Mines to be more valuable than those in Nevada, which have produced the Comstock, Richmond, and other well-known properties, it is quite clear there must be something to be done in Mexico.

The opening of the Mexican Central Railway has set everyone agog, and I expect we shall see some great things. I observe the early birds are picking up the worms. United Mexican shares are gradually creeping up. When they are selling for two or three times more than they are worth, the public will wake up to the idea that there is something in them.—*City, April 22.* OMEGA.

FRONTINO AND BOLIVIA.

SIR,—I felt bound in justice to myself to make a few remarks in answer to the letter of Dr. W. Bradshaw, in last week's *Mining Journal*, respecting these mines and statements made by me in the prospectus. Surely Dr. Bradshaw must have entirely overlooked the reports from time to time of my successors, especially those of Mr. R. White, the company's superintendent for so many years; these reports fully corroborate the report made by me in the prospectus, which was issued in 1864, not 26 years ago, as Dr. Bradshaw states. Had my services been retained, or even had the works I commenced been carried out, I feel assured the results promised by me would have been more than realised. I left England in September, 1864, as superintendent of these mines, and returned August, 1866, which shows the absurd length of time given me for developing this vast property. In the year and nine months I spent in the country I erected 24 heads of stamps, driven by a 30-horse power engine, 12 heads of stamps driven by water-power, made several miles of roads for the transit of engine and other materials from the river, made large clearings of forests for the health of the establishment, erected a number of buildings for accommodation of the workpeople, and anyone with any practical knowledge of mining engineering, more especially in the United States of Colombia, can but admit that my time must have been very fully occupied. I also surveyed and gave an estimate for the bringing in of the Pocune water.

I feared when I left England that my stay in that country would

be of short duration, owing to my having had a lawsuit with two of the directors (vendors of the property), who on account of this lawsuit was unfriendly towards me; indeed, it was only through the urgency of the Chairman (Mr. Vanderbilt) that I was induced to accept the management, he (Mr. Vanderbilt) declining to come on the board unless I consented to go out. I still maintain that this property is an exceedingly valuable one, and if worked economically would pay large dividends to the shareholders for a century to come.
Torquay, April 22. W. GOYEN.

VICTORIA GOLD COMPANY.

SIR,—There has been published in the *Mining Journal* of April 12 and April 19 two letters contradicting certain statements in a letter from Venezuela inserted in the Journal of April 5, signed "C. G. C." If those concerned would answer directly the four following questions he would considerably quiet the doubts and relieve the minds of numerous shareholders:—1. Where are the title deeds of the mine, or copies of them, to be seen by the shareholders?—2. What number of shares in the company have been taken by the board of directors other than fully-paid vendors' shares which may have been allotted to them?—3. Who are at present acting as attorney to the vendor and solicitor to the company respectively? 4. Is all money received from time to time from the company on account of the purchase of the mine paid over to Mr. Lowndes, and if not, to whom is it paid?

The full details of these matters should be made known to the shareholders, and also the public, who may still be disposed to subscribe.—*Heron-road, S.E., April* 24. W. H. F.

COAL IN VICTORIA, AUSTRALIA.

SIR,—I notice in the Notices to Correspondents in last week's Journal that "H. C. B.," of Manchester, is desirous of obtaining some information on the above subject. Undoubtedly Mr. Mackenzie, in his report of 1873, left the subject quite as vague as before, and with no encouragement whatever for capitalists to expend their money in prospecting for this valuable mineral. As I have, however, been privileged to personally inspect part of the supposed carboniferous area of this colony, near Colac, I can confidently assert that coal does exist, as in the bed of a small creek I saw a seam of fully 22 in. in thickness of bright bituminous coal cropping out, the overlying strata being what is termed soft blue metal, and the hill composed of sandstone and shale. At another place, about three-quarters of a mile from this, a small shaft had been sunk some time previous to my visit, and from the debris lying about which had been taken out I picked several pieces of very fine looking coal. On account of this shaft being filled with water I was unable to obtain exact particulars as to the strata passed through, &c, but was informed that two seams had been cut. On reaching a third, at a depth of 145 ft., a strong feeder of water was met with which stopped operations. Another portion of the supposed coal field, near Winchelsea, was reported on a little while ago by Mr. R. A. F. Murray, Geological Surveyor to the Government, and most certainly the particulars he gives and deductions drawn from his examination are very encouraging. I have a copy of his report in my possession, and shall be glad to furnish a copy from it.—*Chester-le-Street, April* 22. A. J. G. SWINNEY, M.E.

PRICE OF LEAD.

SIR,—Several letters have appeared in your Journal about the depression in the lead trade, and although many appear interested, yet nobody takes any steps for revising same. I cannot see that there can be any great opposition to a reasonable advance of prices—as if we consider reasonable *v.* low prices, in the following light, what is the result? That at the present price of lead (11*l.* 10s.) most of the mines are being worked at a loss, and should the low prices continue the closing of many mines must ultimately be the result (throwing numbers of men out of work). Looking at the other side of the question—Who will feel any great loss by an advance of prices? I fail to see any so disastrous effect as low prices cause. Having studied the statistics and all obtainable information on lead, I am of opinion that there is no cause why the price should be so unremunerative, and could be easily improved. Nobody can deny the trouble and anxiety of mining, and why should directors and shareholders who have invested their money for the production of metals which take an active part in our industries, not have a fair return for their capital? Again, the working classes must be affected by very low prices. Will any of your readers take up the matter? and a meeting might be arranged to discuss the present position. Union is power, and no doubt the producers could do a great deal, if they were not so distant. The result of a meeting would no doubt be a step forward in strengthening the market. I only mention lead, having transacted business in this metal, and interested myself in same; but above views refer to other metals also. I wish to mention that a rise in prices will not benefit me one way or the other.—*Coniscliff, April* 24. L. D. R.

CORNISH MINING.

SIR,—There are favourable indications of a revival of Cornish mining enterprise, and a return of the prosperity of former days. "Ichabod" may not yet obliterate the old motto "One and All." In spite of the croakings of some self-qualified oracles we believe the day is not far distant when home mining enterprise will again be encouraged by the prudent capitalist. It must be admitted that in recent times the operations of certain cliques, who advertise themselves widely as the only true market guide of the investor, have caused great prejudice to the true interests of sound mining. They flooded the towns and villages of the country with their "rosy" hued circulars, and by their specious and delusive promises deluded the unwary to enter the folds of which they were the self-appointed shepherds; and, too late, in most instances those who purchased the roses found them transformed into thorns, and those who put confidence in the shepherds found themselves shorn of their wool.

Others again listened to siren voices from the golden Orient promising them the realisation of untold wealth from reefs which, alas, have proved barren and worthless. Directors who were certainly not gifted with the wisdom of Solomon, converted the subscribers' gold into machinery which was either totally unadapted for the purposes intended, or for which there was no work to be found on its arrival. We admit that the search for gold and the less precious metals in foreign lands has in many instances proved highly remunerative, and where prudence and skill have been united with ample capital and sound administration fortunes have in many cases been realised, and we would not discourage the employment of capital in foreign enterprise under conditions based upon careful and competent investigation, but we maintain that home mining enterprise has paramount claims upon the capitalist, and promises more secure returns if conducted with patient industry and on sound principles. The investor has this advantage, too, before risking his capital he may examine for himself or by his trusty agent the accuracy of the statements made, and the *bona fides* of the property that he is invited to assist in developing. Let the investor act upon this principle in all new enterprises, and we feel convinced that the result will be satisfactory.

For those who prefer to take an interest in properties that have been already proved to some extent, the present moment is exceptionally favourable. Never were prices of sound investments of this class so low, and there is no difficulty in making a selection of shares in home mines with excellent prospects, for the investment of a few hundred pounds of spare capital, that with the returning wave of prosperity may speedily realise as many thousands. Without invidious preference we might suggest a few, and we do not hesitate to express the confident opinion that before the end of the present year they will show an advance of 300 or 400 per cent. on the present nominal prices. There are important points to look forward to in connection with some, and the others are giving great promise of good results.

The metal markets are hardening, and a slight advance in price of metals, with a few old-fashioned discoveries in the mines, will bring about a change of phase agreeable to the investor. In mining, as in other affairs, "history repeats itself," and we anticipate that brighter days are again dawning for "One and All." VIATOR

Old Broad-street, April 23.

ELECTRIC LIGHT, AND SAFETY-LAMPS.

SIR,—It is, I know, a subject which is much occupying the attention of practical and scientific men as to whether a really safe electric lamp can be devised for miners, and one which, in addition to its safety, will be suited to the every day requirements of a mine. A very important element for consideration has been as to the possibility of obviating all risk of an explosion if an explosive mixture were present at the same time that a spark was produced by a "breaking of contest" owing to an accidental severance of the conducting wires. It has been supposed that this need not arise if such electric lamp were self-contained—that is, if each lamp were capable of generating or of storing the requisite electricity to give the light without communicating by wires with some central source.

Assuming that some arrangement could be made for a sufficiently portable lamp, possessing the above qualifications, what is to be done in the ordinary working places of a mine to point out the presence of fire-damp, and, approximately, its quantity—that is, its proportion in the atmosphere of the place in question? In my address to the North Staffordshire Institute of Engineers, in February, 1881, when dealing with the question of a safe light for mines, I said—"It strikes me, as an old pitman, very forcibly, that although we may yet be without a perfect safety-lamp, we should not like to pursue our avocations underground, whether in the daily working of a mine or on exploring after accidents without having in our own hands some instrument or other, be it what it may, that will indicate the presence or otherwise of explosive gas."

I have never yet seen any proposal to give a satisfactory solution as to this desideratum; and I beg to call the attention of those who are desirous of introducing the electric light in safety-lamps that—*pari passu* with such a device—miners must have an instrument that will detect the presence of fire-damp, and approximately its percentage as definitely and as easily understood as the best safety-lamp of existing types will do now.

Does this involve the necessity of a workman or an explorer using two instruments—a safety-lamp and something else, and thus increasing the difficulty of watching for indications of fire-damp when his light is not, as now, the apparatus that has to be noticed for such a purpose. I think this query is one that merits the most careful consideration and close attention of all who are engaged in the laudable endeavour to introduce a real safety-lamp whose light is to be produced by electricity. JOHN BROWN, M.Inst.C.E., F.G.S.

Mason Science College, Birmingham, April 19.

REPORT FROM CORNWALL.

April 24.—The market for shares is in what may be called a very tentative condition. No one appears very desirous to sell, and every one appears waiting to buy. Day after day the anxiously expected rise has been eagerly watched for, and every preparation has been made for active business when it came. Pending this most desirable and long-delayed consummation, there has been comparatively little business done, and this very restriction in some mines has led to substantial improvement. Dolcoath has evidently recovered from its various adverse influences, and is most heartily in favour. Nor is this to be at all wondered at, for at the present rate of development within another twelvemonth it would, if necessary or desirable, be capable of turning out very nearly as much tin as almost all the other mines of West Cornwall put together. In fact, there seems literally no end to its productiveness. Dolcoath, however, by no means stands alone in improvement, and it is well within the bounds of probability that the number of dividend mines may be doubled within the next six months. Tin must advance, and copper is very hopeful, though, unfortunately, there are comparatively few copper mines that any probable improvement in the copper standard is likely just at present very beneficially to affect. Unless we can open some entirely new ground there is very little hope for the extension of our copper mining area; and though there are plenty of promising undeveloped setts, there is very little encouragement to take them in hand. As to the many mines which have so seriously taxed the patience and the pockets of the adventurers without yielding anything more substantial than hopeful prospects, the fact that Wheal Agar has so well turned the corner after 50 years effort is unmistakeably exercising a favourable influence upon them.

The consecration of the Brompton Oratory has brought under public notice the finest example of the capabilities for ornamental purposes of the Devonshire marbles that the kingdom possesses. This magnificent church is the work of a young Plymouth architect, Mr. Gribble, and he has introduced massive columns and pilasters and dados of polished Devonian marbles, all from the works of Messrs. Goad, of Plymouth, throughout the edifice. The darker varieties have been chiefly used, including a new rich olive green, unique in its character; but something like a score of varieties, ranging to yellow, white, rose, and dove colour are employed in one of the altars. The Devonshire marbles are thus brought into contrast and competition with the first marbles, not only of the kingdom, but of the Continent, and prove capable of holding their own to an extent previously unknown. As an important branch of the development of the mineral resources of the West, it is to be hoped that the capital work done at the Oratory may have many imitators. There is no lack of material of the highest beauty, and in blocks of the largest size; so that there is no need to fall back upon foreign marbles for constructive decoration.

The Cornish Dynamite Company have succeeded in obtaining a license for their magazine at Redruth, and will have a capital centre for the conduct of their business. It is well for the county to be as sufficient to itself as it can.

It seems a pity that it should be necessary to prosecute mine managers for technical breaches of the Metalliferous Mines Act, as again this week; and yet it is difficult to see what can be done if returns are not made. Surely the law has been long enough in force to be well known.

TRADE OF THE TYNE AND WEAR.

April 24.—The Steam Coal Trade continues to improve on the whole, and steam small is still shipped freely, mostly to the Baltic. The extreme cold weather experienced during the last month has also stimulated the house coal trade to a considerable extent. The gas coalworks in Durham, where they have secured contracts, continue to be fairly employed. Those who have not done so are some of them only moderately employed, and a good deal of time has been lost at some of the large works during the past three months. The men at the Lintz Colliery have received notice that their services will not be required, as it is intended to close the works for some time, probably two years at least. The shipment of coal and coke at Tyne Dock and at the other principal shipping places on the Tyne and Wear have been small during the past week, but that is accounted for by the occurrence of the holidays. Smithy coal is in strong demand for oversea ports. Coke shipments are also improving. Some slight attempts have been made to secure better prices, but those attempts have not been attended with much success. The contracts for coal for shipment (foreign) are now being rapidly completed, and although more coal will be sent abroad than in last year the price realised by the colliery owners will be somewhat less. This is owing to the reduced local demand for ironworks, steamers, &c. The low price of coal generally, and the low rate of freights, are stimulating the sale of coal abroad, and this must bring round an improved trade shortly; 9s. 6d. per ton, less 5 per cent., has been got for best steam qualities.

A strike has taken place of the workmen at the Bebside Colliery, but matters have been adjusted by the masters conceding an advance of 2½ per cent., and also consenting to abolish the "Billy Fairplay" system. Work was again resumed on Monday. A most disastrous fire occurred at the important colliery of Page Bank, near Bishop Auckland, on Sunday last. The works belong to Messrs. Bell Brothers, large colliery owners, and also extensive ironmasters. The workings in the colliery are very extensive, and upwards of 800 men and boys are employed. There are two shafts, and around these shafts a number of engines of various kinds are placed. The general arrangements at the works were of the highest order, and the origin of the fire is a complete mystery, as the whole of the engine-rooms were lighted by electricity and warmed by steam pipes. It must be considered, however, that this is an old colliery establishment, and, as usual, the erections on the surface for delivering the coal, known as the Heapstead, were constructed of wood, and when these wooden erections happen to take fire it is almost impossible to extinguish them. In this case the greatest exertions were made by the manager, Mr. Harle, Mr. Clough, engineer, and a numerous staff. A good force of fire-engines were procured and there was a good supply of water, yet the whole of the erections and engines were totally destroyed. A large coal-shed in which was stored about 1100 tons of coal was also destroyed and the coals burnt. Coal wagons, also large trucks belonging to the North-Eastern Railway Company, were also destroyed. The greatest exertions were made to prevent the fire getting into the shafts, but without avail, and most of the timber in the shafts was also consumed. Fortunately there were no hands in the pit, it being Sunday, and when the fire was burnt out the workings were entered from the air-shaft, and also from the Browney Colliery, 1½ mile distant, when it was found that there was no injury done to the workings, and 40 horses and ponies were also found uninjured. The total damage is estimated at from 20,000*l.* to 30,000*l.*, and of course the works will be closed for a considerable time. At most of the modern coal winnings the use of wood at the surface erections has been entirely discarded, and iron has been substituted in the place of wood. In these places the danger from fire is very much less of course. Twenty-four years ago a serious fire occurred at these works, and 16 lives were lost on that occasion, but the fire at that time occurred in the bottom of the shaft.

The Iron Trade continues extremely quiet. The shipbuilding trade does not improve, and this of course has an adverse effect on the iron trade, the marine engine trade, and many others connected with them. There is a good demand for locomotives, and many enquiries at present, so that this class of engineers are busy. There is also a good demand for foundry work, and the demand for iron bridges has been very large during the present year in this district. There is also a good demand for railway work, for iron and steel rails, chairs, sleepers, &c. If the anticipations of iron shipbuilders in this district are realised they will not put out more than one-half the work they are capable of performing during the present year. It is to be hoped, however, that this anticipation will not be realised; trade may possibly revive much more quickly than present appearances indicate, and it is hoped in some quarters that the iron trade may receive some benefit from the course of business in America. Should any important alterations be made in the tariff of that great country these hopes may be realised Iron shipbuilders also appear to have neglected entirely the building of small steamships, and thus foreign vessels have taken possession of some trades or ports where large vessels cannot enter owing to the draught of water. Brown's Export List for last month shows this very clearly. The following figures show the number of foreign and British vessels that took cargoes of coal from the ports named last month for export:—Newcastle, British, 260, foreign, 162; Blyth, British, 13, foreign, 21; Sunderland, British, 66, foreign, 47; Hartlepool, British, 26, foreign, 48; Middlesborough, British, 11, foreign, 13. The shipments in foreign vessels at Blyth, Hartlepool, and Middlesborough prove clearly the position we have taken.

The Shipping Trade continues in a very depressed state, and many vessels are still laid up. A private meeting has been held in Newcastle, but it is intended to hold another on a much larger scale on April 30, and it is expected that it will be attended by shipowners and managers from a large number of ports in the United Kingdom. A circular has been printed which will be sent to the cargo steamship owners generally. It is intended to propose—1. That shipowners shall combine and agree to form an association in which all the vessels shall be entered.—2. That each owner having four or more vessels shall agree to lay up one-fourth of the tonnage controlled by him.—3. Owners with less than four vessels shall lay up their vessels for a corresponding period of time as the number of vessels may represent.—4. That the owners of vessels be allowed 6d. per gross ton registered per month towards the cost of laying up, such sum to be contributed *pro rata* by the steamers trading. Such is a brief outline of the intended regulations of the projected Shipowners' Union, and it is expected that the movement will be general, and take effect at an early date. Experience will show, but it appears to be a very difficult undertaking, and should it be accomplished it appears to be reasonable to suppose that foreign ships may be employed in the place of British vessels.

The award of Dr. Watson in the iron trade has been given. The employers claimed 1s. per ton reduction on puddling and 10 per cent. on all forge and mill work. The award is, that from April 12 and ending June 28 next the reduction shall be 3d. per ton in puddling and 2½ per cent. on all other forge and mill wages. Puddlers will now get 6s. 9d. per ton—the lowest rate ever known except in 1879, when the price was 6s. 6d. per ton.

On Tuesday, at the second bore-hole which is being put down by Mr. Vivian, of Whitehaven, for Messrs. Bell Brothers of Port Clarence, Middlesborough, salt was reached at a depth of 1030 feet. This bore was only commenced in the middle of January last. Although other firms are endeavouring to find salt in the district, Messrs. Bell Brothers are the only people who have yet been successful in introducing the new industry. They are making satisfactory progress with their chemical works, in course of construction near their ironworks at Port Clarence.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

April 24.—Trade has in no way improved since last notice, so that the collieries are only working about four days a week. The wages question is now causing some commotion, for the men at a colliery close to Clay Cross came out the other day rather than submit to a reduction. Dronfield and Unstone are both apparently going to the bad. The loss of the steelworks at the former place is still severely felt, there being nearly 400 empty houses in the locality. The stoppage of the colliery, it is to be hoped, may be averted, for the men must now know that the owners would not take the extreme step of taking up the rails and timber unless they were compelled to do so The stoppage of the pumping will have the effect of diverting the water into other pits at a lower depth, and Mr. Rangeley has, in consequence, been obliged to give his men notice, so that the place can be closed. Indeed, the price of coal has come down to that point that mineowners must either lessen their expenses considerably or make up their minds to carry on at a loss. This is the case as regards some of the largest collieries, where the coal is the thickest and best, and, of course, it must be much worse for those who are working inferior and thin seams. The business doing with the Metropolis from Clay Cross, Grassmoor, Blackwell, Eckington, and some other of the leading collieries has been of a moderate character, but fully as good as can be expected for the time of year. Merchants, of course, will not care to hold anything like heavy stocks just now, seeing that, with a less demand during the summer months, the pit prices are likely to be even lower than they now are.

In gas coal there is not so much doing, and interest is now centered in the new contracts invited by the gas companies. As things are at the present time it is not likely that the price will be at all above that of last year, if it is not lower. Steam coal goes off tolerably well, considering that but little is sent to any of our ports for exportation. A considerable tonnage is required for smelting at the local ironworks, whilst the consumption in respect of the railway companies appears to be increasing. Engine coal is still somewhat languid, more especially for the Lancashire district, there being a good deal of competition in this branch of trade on the part of different districts. The iron trade keeps up favourably, and so far there has been no falling off in the production of pig, and it is said that some good lines have been booked lately for delivery in Staffordshire, whilst the consumption has kept up well. In rolled iron the output has kept up to the average, but is below that of former years. The large foundries engaged on heavy work have had nothing much to complain of lately, but the smaller ones engaged on light and ornamental castings are rather quiet. In malleable iron and castings of the same the business done has been of a steady character

In Sheffield some of the lighter branches of trade are looking better, whilst no change has taken place as regards the heavier ones. The leading cutlery houses are kept fairly going, and a number of the manufacturers of table and other blades have joined together for the purpose of making prices uniform, and so doing away with the competition which has hitherto prevailed to their own injury. Some of the edge tool makers are now well employed, principally upon shipping orders, Australia, Canada, and New Zealand being amongst the best customers. The rail trade remains without change, the output being still far below what it was, but there is a steady business doing in other descriptions of railway material, including springs, axles, and tyres. For plain Bessemer, however, the demand has improved, being used for many purposes instead of crucible steel. The steel made by the open-hearth process is also more enquired for, being specially well adapted for plates. Ordinary steel castings are in tolerably fair request, more especially wheels in sections and otherwise. No decrease has taken place in the production of armour-plates, and the two establishments that enjoy the monopoly of them have as much as they can, but there is not so much doing in the old type of iron plates for ships and boilers. The engine-works are kept steadily going, and some of the foundries are better employed than they were in the earlier part of the year. More is doing in pipes, as well as in cooking ranges and builders' fittings.

In South Yorkshire the coal trade remains in much the same state as for several weeks past, about four days a week being the rule at most of the collieries. House coal of course does not go off so well, still a fair tonnage of the thick seam is sent to London from several of the principal collieries. Steam coal, however, is now going off better, and the shipments from the Humber during the next few months promise to be large, more particularly to the Baltic ports, where the Yorkshire steam coal is well known and appreciated. Engine coal meets with a rather moderate sale, and the prices realised are such as not to leave any profit to the sellers. The coke trade keeps up well, a large tonnage going into both Lincolnshire and Derbyshire to the furnaces in those counties.

Despite several protests there is no doubt that the proposal for the amalgamation of the Midland Institute of Mining Engineers with that of Derbyshire will be carried out. The former has, as a rule, held its meetings in Barnsley and the other in Chesterfield. But by the two bodies becoming one the head-quarters will be at Sheffield, and rooms have been given for the purpose of meetings, &c., by the gentlemen connected with the Firth College, and in that building.

REPORT FROM LANCASHIRE.

April 24.—With the exception that the recent cold weather has helped to give a little more animation to the demand for the better classes of round coal for house-fire purposes, there is no very material change to report in the condition of the Coal Trade of this district. Stocks are perhaps not going down quite so heavily as they were, but it is only in a very few cases that the pits are kept running more than four days a week at a great many of them that average time does not exceed three days a week. Common classes of round coal for ironmaking and steam purposes continue bad to sell, and of these there is a good deal held in stock. Quoted prices remain about the same as last week, but it is only in one or two exceptional cases that 9s. 6d. is still being got for best Wigan Arley at the pit mouth, 9s. being now about the average figure, with Pemberton Four-feet about 7s. to 7s. 6d., and common round coals, 5s. 6d. to 6s. per ton. It can however scarcely be said that there are any really fixed prizes, as for quantities special quotations are made, and where anything like orders of weight are concerned sellers are prepared to give way rather than allow business to pass them.

For the limited supplies of engine fuel there is still a fairly good demand, but there is no actual pressure sufficient to enable better prices to be obtained. At the pit mouth burgy averages about 4s. 6d. to 5s., best slack 4s. to 4s. 3d., and ordinary qualities 3s. to 3s. 6d. per ton.

In the shipping trade there are rather more enquiries stirring, and a moderate business is being done; but there is so much common round coal offering in the market that extremely low prices are taken to secure orders and for delivery, either at the Garston Docks or the High level, Liverpool. Lancashire steam coal can be bought at from 7s. to 7s. 6d. per ton.

The question of a reduction in miners' wages is still talked about in the West Lancashire district, but it is becoming very doubtful whether any definite action will be taken, at least for the present. In both the pig and finished iron trade business continues extremely dull, and, in fact, since the Quarterly Meetings there has been little or nothing doing. It can scarcely be said that it is high prices which stand in the way of business, but rather a general want of confidence with regard to the future. Users of iron are unable to look forward with any degree of certainty as to the possible extent of their requirements, and as there is no prospect of any upward movement in the market they prefer to buy simply from hand to mouth. In pig-iron prices, so far as quoted rates are concerned, show no very material change. Lancashire makers still ask 43s. 6d. to 44s., and Lincolnshire brands average 43s. 4d. to 44s. 4d. less 2½ for forge and foundry qualities delivered equal to Manchester, but the tendency of prices is downwards, as makers would now be more open to offers at below quoted rates, and in outside brands, such as Scotch and Middlesborough there are sellers at under the current market prices. The business doing in hematites continues very small, with 56s. less 2½, about the average price for good foundry brands delivered into the Manchester district. Finished ironmakers are now in most cases open to accept 5*l.* 15s. for good local and North Staffordshire bars delivered into the Manchester district, but at this figure there are very few orders giving out. Engineers generally are still kept fairly employed, tool makers, and machinists, as a rule, being busy, but new work comes forward very slowly, and it is only at the lowest possible prices that orders can be got.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

April 24.—The mills and forges having now resumed, after the suspension for the holidays, the coal trade shows a little more vitality than at the date of last report. But there is not much new buying going on, and prices remain unsatisfactory. Some consumers are looking for the declaration of a reduction in Cannock Chase prices on May 1. Whether it will take place then, or will be delayed for awhile longer, will apply more to house than to manufacturing coals. Common mill coal from the Chase is 6s. to 7s. per ton, and forge 5s. to 5s. 6d. per ton. Steam sorts may be had in some instances as low as 4s. 6d. to 5s. Best deep house coal is 10s. nominal, and best qualities from the shallow seams 8s. per ton. New business in the pig trade is restricted. Northampton qualities are 43s., and Derbyshires 44s. per ton. Hematites 57s. to 58s. 6d. Native prices were unchanged. Sheet makers are declining orders on all hands rather than accept some of the prices now offered. Their minimum is 7*l.* 5s. to 7*l.* for singles, and 7*l.* 15s. to 7*l.* 10s. for doubles.

The meeting of the Coal Trade Wages Board came off in Wolverhampton on Wednesday. Mr. J. B. Cochrane presided, and stated that several gentlemen had refused to occupy the position of President. They had all refused upon the ground of other business. He believed, however, that the real cause of the refusals was the circumstance that these gentlemen were of the opinion that the operative section of the Board were not loyal, and would not consent to abide by their awards. Other masters argued in the same strain, after which the operatives replied that they desired an abandonment of the proposal that a sliding-scale should regulate wages in the future. If the masters agreed to this they would on their part consent to abide by the decision of the arbitrator upon the claim for a reduction of wages. Ultimately this course was adopted, and afterwards the Board sat in private to decide whom they should now ask to fill the post of President and arbitrator.

On Monday in Birmingham the ironmasters will argue their claim before Alderman Avery, the President of the Iron Trade Wages Board, for a drop in puddlers' wages of 6d. per ton, and upon millmen's wages of 5 per cent. The workmen's leaders still vigorously oppose the demand.

It is stated that the ironworkers employed by the Patent Shaft and Axletree Company of Wednesbury have determined not to follow the decision of the Wages Board. They have agreed with the masters to relapse into the old system of giving and taking 14 days' notice before any change in wages occurs.

Mr. Alfred Hickman, of the well-known Spring Vale Furnaces, Bilston, has resigned his seat upon the Mines Drainage Commission, and also his post of director of the Chillington Iron Company, Wolverhampton. Pressure of other engagements is believed to be the reason for the retirements.

A judicial decision has been given which is of great interest to colliery proprietors. The Sandwell Park Colliery Company summoned on Monday twelve miners for neglecting their work, and assessed damages at 53*l.* The men left the mine on March 25th last upon the ground that they had worked an extra quarter of an hour on the previous Saturday. A suggestion from the manager that the quarter should be treated as overtime, or that operations should be finished earlier to make up for the increased labour, was not listened to, and the pit was allowed to stand. The men were ordered to pay 20s. and costs each.

The North Staffordshire Mining Institute had read to them this week a paper on safety-lamps by Mr. A. R. Sawyer, Assistant Government Inspector of Mines. The author stated that from experiments he had found that gas was more frequently detected in the Belgian Mueseler than in the Marsaut. On several occasions gas burnt within the inner gauze of the Marsaut for several seconds after the lamp flames had gone out. Touching the light, he said that for his own part he was content with that from a well-trimmed Mueseler. After discussion a vote of thanks was accorded to Mr. Sawyer.

TRADE IN SOUTH WALES.

April 24.—A speech made by Mr. Harris, of the Treharris Colliery, Rhondda Valley, lets a little light upon the habits of colliers, and inasmuch as it was made in the presence of the men the statements are no doubt true. The Treharris Colliery is no doubt the most costly in South Wales, with the single exception of Nixon's Navigation, half a million of money having been spent upon it. In the course of his speech Mr. Harris told the men that the best way they could serve him was by working 54 hours per week. At present they lost not only Monday, which he did not so much grumble at, but Tuesday, and sometimes Wednesday, so that they only averaged 42 hours per week instead of 54. He had worked the colliery for 8 or 10 years, and had not received one sixpence profit. They must raise 5000 or 6000 tons per week to make the concern pay. He wound up his speech by alluding to the evils of intemperance.

The course of the Coal Trade in South Wales during the past week was checked to some extent by the holidays, but the amount sent away from Newport and Swansea did not show much falling off. Cardiff shipped 109,022 tons foreign and 23,220 coastwise, with 3170 tons of patent fuel; Newport, 31,097 tons foreign and 21,727 coastwise; Swansea, 18,016 tons foreign, and about 15,000 coastwise, with 4322 tons patent fuel. Prices remain about the same as last week. Some of the house coal collieries in the Rhymney Valley are very slack, but the steam coal pits are in full work. In the Forest of Dean trade is looking up, owing to the coalmasters having resolved to make no further reduction.

The Steel and Iron Trades remain quiet. Newport sent away a parcel of 2300 tons to Montreal last week, and 50 tons to Hennebont. Cardiff only exported one small parcel of 421 tons. The Iron Ore Trade remains depressed. Cardiff received 1599 tons from Bilbao last week, and 3474 from other places; Newport received 6780 tons from Bilbao, and 2355 from other places.

The Tin-plate Trade continues to show signs of improved activity, and prices are advancing. Good IC cokes are quoted at from 16s. 6d. to 17s. per box; and charcoals from 17s. 6d. to 20s.

The Tregibond Colliery, near Caerphilly, has been purchased by Messrs. Hill Brothers, the contractors for the new reservoir at Llanischen, which will form part of the new system of water supply for Cardiff. The amount to be expended is 285,000*l.*, which, with 30,000*l.* given for the old reservoir, will represent a total expenditure for the water supply of Cardiff of 585,000*l.*

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

April 24.—In the South Merionethshire slate district, from Corris to Abergynolwyn, the slate trade is not so good, and the men at the latter quarry have submitted to a reduction in their wages of 10 per cent. A considerable number have preferred emigrating to America. In the Festiniog and the Carnarvonshire districts the trade continues to improve. An important industry connected with the slate trade is that of the manufacture of writing slates. There are half a dozen manufactories in Carnarvonshire, near Bangor, Aber, and Llanllyfn, and these are all steadily employed. The slates used are the purplish blue of the Carnarvonshire quarries. Another industry is that of slate enamelling, for which the blue slates of Festiniog and Corris seem best adapted. The slabs are ground, japanned, and baked in large ovens, resembling metallic japanners' ovens, and the ornamentation—imitations of serpentine, granite, and inlaid work are really a credit to the Principality. The quarries on the south side of the Dovey, in Cardigan, are now closed.

The celebrated lead and zinc mines of Talargoch, Flintshire, which have been productive for centuries, are now for ever closed. For some time the machinery at them has been left up in order to enable the men to get what ore they could on their own account, but last week workmen began to take it down. Fearing a disturbance the owners applied to the county authorities, who sent a body of police armed with cutlasses. Happily there was no need for the use of the cutlasses—the poor miners, whose living has now gone, submitted to the inevitable.

Considerable rejoicings took place in Wrexham on the receipt of the announcement that the Connah's Quay Bill had passed the Lords Committee, and also on Saturday evening last, on the occasion of the return from India of Mr. Benjamin Piercy, C.E., the engineer of the different railways connected with Connah's Quay and Wrexham. The receipts of the Cambrian Railway show an increase of 188*l.* on the week before last, and the decrease from the commencement of the year is now reduced to 12*l.* This shows a recent steady increase in general traffic. The same company have now a movement on foot for the construction of a pier at Aberdovey, and improving that port.

As the result of the audits in connection with three of the Welsh collieries, it is found that the prices realised during the first three months of this year do not justify an increase of wages during the current three months. The coal trade is scarcely as good now as during the winter, but it is quite as good as it usually is at this season of the year. It is anticipated that the construction of the new railways now before Parliament will lead to a development of the North Wales coal field eastward. A fatal accident occurred in the stone quarry of the Liverpool Corporation at Llanwddyn on Friday last when Thomas Williams, a youth engaged in spragging the wheels of the stone wagons was run over by three of them and was killed.

SPITZKOP (TRANSVAAL) GOLD MINE.—A correspondent at the gold fields of the Port Elizabeth Herald (Feb. 25) writes:—The Spitzkop property, owned by Guilband and Co., lies the highest of any of the old gold fields. The place is undoubtedly the best and cheapest that has yet been in the share market. Very few people know what quantity of gold has been taken off this property. On the west side of the farm the gold is found in leaders, by sinking shafts from 10 to 60 ft., when the leaders are struck in a certain slate formation; they follow up these leaders by drives until it slips into a different formation, where they are barren of gold. Only one digger has gone through the second formation, and again struck the gold-bearing formation deeper. As the farm is in the hands of concessionaires the diggers have not followed up their researches deeper down. The auriferous stuff is taken to the water and sluiced, and yields from 6 to 100 ozs. per diem. I know one digger who took out over 500 ozs. in three days. On the east side of the farm are the claims of Messrs. Silo, Stanley, and Tate. These parties have the richest claims on any property I have seen on the fields. They have all the water worth speaking of on this farm, having 24 miles of water-races commanding the highest level on this property. Their ground alone is worth the amount for which the Spitzkop Company has been floated. The two latter partners being old experienced diggers have used their experience to advantage. In working their claims, they followed up the gold step by step until they struck rich gold-bearing lodes, yielding as much as 69 ozs. per ton. They sank different shafts from 30 to 40 ft. into this rotten reef, and found this reef still going down. They were working on the face of a hill, and from the appearance of the formation in the paddocks it shows that the reef dips into the hill in a north-easterly direction. Distinct traces are found of an old river bed on the side of this hill at a depth of about 31 ft. from the surface, and in this bed a large quantity of gold was found. The gold-bearing quartz is a conglomeration of iron and quartz; a regular pudding-looking stuff, easily broken up, and simply smothered in very fine gold—finer than flour. The gold is so fine that you find it float on the water when panning it off.

WORKING-CLASS LAND AND HOUSE OWNERS IN NEW SOUTH WALES.—The percentage of the wage-earning class owning land or house property is larger in New South Wales than in any country in the world, with the exception of portions of the United States.

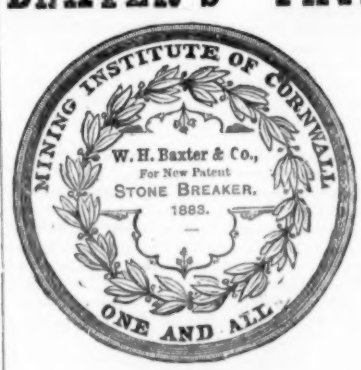
SHEEP IN NEW SOUTH WALES.—The rapid rise of the pastoral interest in this flourishing colony is shown by the fact that the number of sheep has risen from 17,560,046 in 1872, to 32,790,380 in 1882; while the export of wool, which in 1871 was 65,611,953 lbs., of the value of 4,748,160*l.*, had increased in 1881 to 139,601,506 lbs., of the value of 7,149,787*l.*

CORNISH PUMPING-ENGINES.—The number of pumping-engines reported for March is 13. They have consumed 1563 tons of coal, and lifted 11·7 million tons of water 10 fms. high. The average duty of the whole is, therefore, 50,300,000 lbs. lifted 1 ft. high by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Carn Brea—76 in. ..... Millions	51·2
Mellanear—76 in.	55·7
West Basset—Thomas's 60 in.	57·3
West Wheal Seton—Harvey's 85 in.	62·3
West Wheal Seton—Rule's 70 in.	65·2

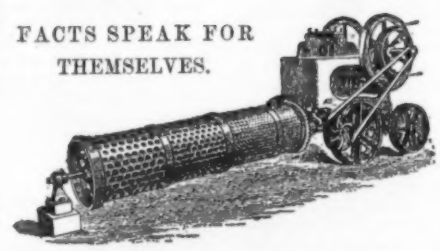
ALSO AWARDED GOLD MEDAL AT CALCUTTA EXHIBITION.

BAXTER'S PATENT KNAPPING STONE BREAKER.



1881.

FACTS SPEAK FOR THEMSELVES.



To Mr. Baxter, Leeds. *Cinderford, Feb.* 13, 1883.

DEAR SIR,—I am pleased to be able to tell you that the Machine works splendidly. We are breaking 16 trucks a day now, and we thought it a good day's work to do 10 a day with the old Machine, so you can see the difference. I had a gentleman looking at it yesterday, and he was surprised to see it work so easily. Yours truly, E. ORGAN.

The above refers to one of our 16 by 9 Machines we supplied to replace an "Improved Blake" 15 by 9 Machine. Several of which have already been replaced by Baxter's.

PATENTEES AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE MEXICAN MINING COMPANY (Limited).—Capital 400,000*l.*, in shares of 5*l.* To mine, let, obtain, produce, test, prepare, treat, smelt, refine, work, manufacture, and deal in mineral and metallic substances, or the products or combinations thereof, and to carry on in that country all the operations incidental to a mining and smelting company. The subscribers (who take one share each) are—F. J. Warner, 93, Bishopsgate-street, accountant; A. Allworth, Peckham, M.D.; M. Sharpe, Hanwell Park, J.P.; E. J. Charter, 9, New-square, major; C. Hayes, 31, Lombard-street, clerk; T. J. Fisher, 50, Lombard-street, stationer; T. F. Smith, Leyton Buzzard, accountant. The number of directors is not to exceed nine or be less than three. Future directors will be required to hold stock to the value at least 1 250*l.*

THE NEW ROMAN GRAVELS BOUNDARY MINING COMPANY (Limited).—Capital 60,000*l.*, in shares of 1*l.* To adopt and carry into effect an agreement made between G. S. Underwood of the one part, and H. Mason on behalf of the company of the other. To purchase or otherwise acquire any interest in any mines or lands situated in the United Kingdom, with power to sell, let, or mortgage, or develope, work, and maintain, or otherwise dispose of same. The subscribers (who take five shares each) are—J. M. Birch, Rochester-terrace, mail contractor; G. Holla, 27, Horseferry-road, C.E.; G. W. Heathcott, 142, Great Tichfield-street, gentleman; H. Dodson, 1, Harwood-grove, omnibus builder; H. B. Spence, 3, Marsham-street, chemist; J. J. Fry, Chelsea, manager of steamboat works; W. Whorldon, 42, Devonshire Chambers, engineer.

THE SWANSEA BAY GRAVING DOCKS AND ENGINEERING COMPANY (Limited).—Capital 150,000*l.*, in shares of 50*l.* Carrying on at Swansea and Briton Ferry the business of graving dock owners, shipbuilders, engineers, makers of engines, boilers and machinery, founders, &c. The subscribers are—J. J. Jenkins, Swansea, 20; J. Mesnier, Swansea, 20; C. O. Young, Cardiff, 20; F. C. Strick, Swansea, 20; J. R. Christie, Cardiff, 20; C. W. Christie, Cardiff, 20; W. R. Collins, Swansea, 5; W. H. Taylor, Whitby, 20.

THE STRETTON LANDSDALE COLLIERY COMPANY (Limited).—Capital 60,000*l.*, in shares of 5*l.* The immediate acquisition of all the estate, rights, title, and interest, known as the Stretton Lansdale Colliery, which is situated in Derbyshire, together with the plant, machinery, and effects belonging thereto, for the purpose of carrying on the businesses of colliery proprietors, miners, coal merchants, &c. The subscribers are—J. O. Hunt, South Hackney, gentleman, 20; W. O. Curling, Chiswick, gentleman, 20; E. Grey, Leytonstone, gentleman, 20; W. C. Taylor, Stretton, colliery proprietor, 50; A. Tidmarsh, Woolwich, gentleman, 20; H. Hancock, Bow, builder, 20; J. H. Evans, Chelsea, traveller, 20.

THE CENTRAL MARKETS COLD AIR STORES (Limited).—Capital 20,000*l.*, in shares of 10*l.* To establish, build, fit up, and maintain in London stores, vaults, warehouses, &c., for keeping and selling, freezing and chilling meat, and any other article of food. The subscribers (who take one share each) are—E. S. Houlder, 146, Leadenhall-street; E. Crawford, 146, Leadenhall-street; T. L. Devitt, 39, Fenchurch-street; J. Moore, 39, Fenchurch-street; C. E. Green, 13, Fenchurch Avenue; J. Bell, 13, Fenchurch Avenue; A. Towers, 239, Meat Market.

THE PARLIAMENT LAND COMPANY (Limited).—Capital 500,000*l.*, in shares of 50*l.* To acquire land in Whitehall, and within one mile from Charing Cross, erecting thereon and maintaining mansions, offices, hotels, refreshment rooms, &c. The subscribers (who take one share each) are—W. Hall, Lancing; R. C. Ponsonby, 105, St. George's road; F. W. Cutlack, Brighton; T. W. Golding, 27, Victoria-street; W. Hollebone, 5, Whitehall-yard; A. Martin, Brixton; W. T. Mitchell, Bromley.

HARTIN'S CRIMSON SALT COMPANY (Limited).—Capital 15,000*l.*, in shares of 5*l.* To acquire, carry on, and extend an established business. The subscribers are—J. Brinton, 52, Cornwall Gardens, 500; S. Stretton, Kidderminster, 100; G. Taylor, Kidderminster, 100; W. Hepworth, Kidderminster, 10; G. N. Preen, Kidderminster, 1; H. E. Preen, Kidderminster, 5; J. E. Stone, Kidderminster, 100.

THE PATENT ROLLER COASTER COMPANY (Limited).—Capital 5000*l.*, in shares of 1*l.* The business of makers and proprietors of roller coaster apparatus, and using such apparatus for public exhibition and use. The subscribers (who take one share each) are—A. Kisnam, 31, Charlwood-street; F. B. Scott, 66, Lead-street; A. G. Wulff, 66, Lead-street; G. M. Hicks, 12, Argyle-square; R. Wilson, 56, Penton-street; E. T. Gregory, Brixton; C. F. Newman, Brixton.

THE DELTA SYNDICATE (Limited).—Capital 202,000*l.*, in shares of 100*l.* and 1*l.* To establish in France or Egypt any society, association, company, or syndicate to carry out all kinds of works, and generally to develop the resources of the Egyptian Delta. The subscribers (who take one share each) are—F. Walters, 12, Tokenhouse Yard; J. S. Collman, 12, Tokenhouse Yard; T. Dias, 41, Moorgate-street; F. J. Isaac, 92, Great Winchester-street; W. Graham, Temple; J. A. Garofalts, Victoria-street; J. M. de Zuberta, Victoria-street.

THE NORTH MONTANA COMPANY (Limited).—Capital 150,000*l.*, in shares of 1*l.* To carry on in all branches the various operations immediately connected with the business of a mining and smelting and land company. The subscribers (who take one share each) are—E. O'Dwyer, 72, Bishopsgate-street; H. H. Shrigley, 21, Belsize-road; J. T. Brown, 6, Drapers' Gardens; W. J. Patterson, 6, Drapers' Gardens; H. Moulding, 22, Maltby-street; W. J. Hurst, 35, Chornnest-street; R. Kintern, 119, Baker-street.

THE GUILDHALL INVESTMENT, PROPRIETARY, AND ADVANCE COMPANY (Limited).—Capital 10,000*l.*, in shares of 10*l.* The subscribers are—R. W. Ledge, 12, City-road, 25; J. R. McArthur, Bedford-row, 25; E. B. Green, 1, St. George's-road, 25; W. H. Atkins, Lewisham, 25; E. Murton, Forest Hill, 20; J. T. Ledge, Dalston, 4; H. D. Smith, 78, Upper Gloucester-place, 1.

THE CHURCH AND DISTRICT INVESTMENT COMPANY (Limited).—Capital 10,000*l.*, in shares of 12*l.* 10*s.* The business of this company and that of the preceding one is that of making advances to shareholders and others, and to carry on a general financial and discount business. The subscribers are—G. Metcalfe, Oswaldwistle, 4; J. T. Rothwell, Sham Hall, 4; M. Howorth, Oswaldwistle, 6; J. Riley, Accrington, 8; W. Sidebottom, Oswaldwistle, 4; J. Green, Accrington, 8; C. A. Handley, Oswaldwistle, 8.

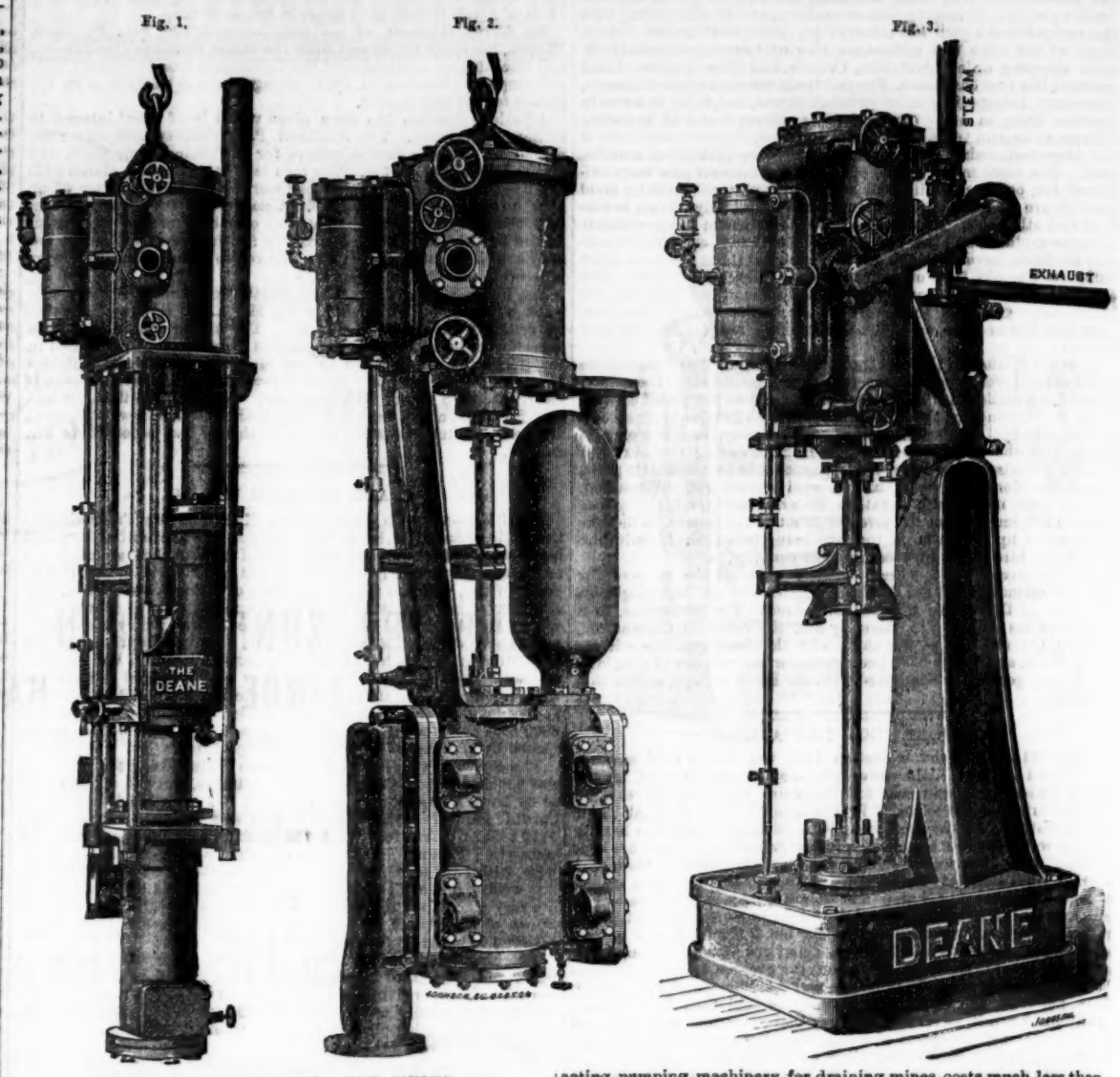
THE HOUSE DECORATION COMPANY (Limited).—Capital 5000*l.*, in shares of 5*l.* To acquire certain patents, and to manufacture and sell mural, ceiling, and other hangings, decorations, and ornaments. The subscribers are—A. L. Elborough, Croydon, 5; E. M. Goodwin, 20, Philbeach Gardens, 1; S. C. Overton, Croydon, 1; E. Attfield, West Croydon, 1; J. Laitwood, Brookley, 1; J. A. Fulthorpe, Brockley, 5; C. Hopkins, Chelsea, 1.

FREE LIBRARIES IN AUSTRALIA.—Free libraries are now to be found in all parts of Australia, that of Sydney being one of the largest. In connection with it is an extensive lending library of 18,188 volumes, embracing every class of literature, the catalogue being a bulky volume of 526 pages. During 1883 74,410 volumes were issued, as against 57,802 in 1881. Works in natural philosophy, science, and art—in fact, all the higher branches of literature—are largely in demand, thereby furnishing an encouraging illustration of the development of intellectual taste among the members of the Australian community.

THE increase of population in New South Wales has been more rapid during the last few months than for some years previous, the population of the colony at the present moment exceeding 870,000, instead of 820,000, as estimated at the close of 1883.

HOLLOWAY'S OINTMENT AND PILLS.—Those who have given these remedies a fair trial freely admit that they inherently possess every property suitable for healing and removing eruptions, ulcerations, fistulas, abscesses, sores, bad legs, gathered breasts, and all disorders of the glandular system. When carefully rubbed in the ointment relaxes the swollen muscles, diminishes inflammation, assuages pain, and even alleviates dangerous maladies which may have lasted for months, or even years. Holloway's excellent preparations are effective singly, resistless in combination, and have been recommended by grateful patients to be resorted to as alteratives when all other means of regaining health have failed. Their action is temperate, not violent or reducing.

VERTICAL STEAM PUMPS FOR MINES.



VERTICAL STEAM PUMPS FOR MINES.

That the principle of construction followed in the manufacture of a pump meets with very general approval may be considered as having been practically expressed by the fact that 10,000 of them have been purchased in the United States within a few years; and as the PULSOMETER ENGINEERING COMPANY, of the Nine Elms Ironworks, have now undertaken its introduction into this country, an opportunity is afforded to miners and others to test its merits. The Deane pump, for that is the machine referred to, is applicable to all the general uses of a direct-acting steam pump, and in one form to which more detailed reference will be made presently, it is claimed to be one of the best mining pumps extant. The peculiar excellence of the pump consists in the extreme simplicity of its mechanism and its certainty of action. It is pointed out that its valve gear consists of fewer pieces than are found in any other pump. All the parts move on parallel lines and in the same vertical plane, so that all levers, connecting rods, rocker arms, springs, adjustable screws, and other mechanical complications are avoided. Both the main valve and the supplemental valve are flat side valves, readily understood, and easily reseated in case of wear. The supplemental piston is in one piece, and is a piston, not a valve.

The supplemental piston, which has a compensating steam jacket, is driven by a direct pressure of steam on alternate ends, complemented when necessary by the whole power of the main engine, so that it runs equally well vertically or horizontally exhausting into open air or into a condenser. The mechanical connection between the main piston and its valves renders it absolutely certain that the valve shall always lead the piston, so that there is no possibility of any pounding on the cylinder heads, and the clearance in the cylinder is reduced to the minimum. The machine—simple, yet lacking nothing essential to a perfect pump—is always ready and in position to start at any point in its stroke on the admission of water, air, or steam, and to run at any speed desired, either the fastest or the slowest. In calculating the approximate delivery in gallons, the company assume a piston speed of about 100 ft. per minute; but it should be remembered that the wear of all direct-acting steam pumps is roughly in inverse proportion to the speed at which they are run—that is to say, a pump worked at 75 ft. per minute will last nearly double as long as one running 100 ft. per minute. Users will, therefore, find an advantage in the end by putting down a pump rather larger than is required.

Several forms have been extensively employed as mining pumps, and in every case complete satisfaction has been given. The Deane double plunger pump has two plungers working in opposite ends of a water cylinder, divided in the centre, with valves, &c., of the most approved construction. It is intended for situations where the heavy pressure and a gritty nature of the water renders the use of a piston pump undesirable, also for thick liquids, such as tar, &c. For mining work the exhaust can be carried into a condenser, thus ridding the mine of the annoyance of escaping steam, and adding to the efficiency of the pump at a small cost. Notwithstanding the fact that direct-acting pumping machinery for draining mines costs much less than any other style, a prejudice exists against its employment on account of the concussion, so destructive to pipes and connections, that attends the use of improperly designed and constructed machines. This is entirely obviated in the Deane patent mining pump by applying a simple cushion to the steam cylinder, compelling the piston to stop and start slowly at the end of each stroke so that the water valves may have time to seat quietly, and cause no shock or jar.

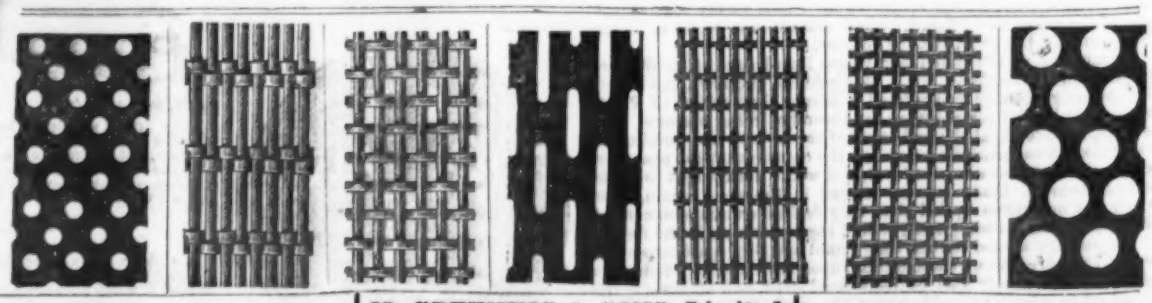
The above illustrations represent the Deane principle applied in sinking pumps—that is to say, pumps for use in sinking shafts, pumping out flooded mines, or for any use where a varying water level must be accommodated. They will work suspended from a chain, and can, therefore, be readily lowered as the water is pumped out, and be raised to avoid danger in firing shots, or they can be suspended on the mine timbers by the "dogs" provided for this purpose, and still be easily removable. They are very compact, requiring but little space in the shaft. In confined situations they are often very useful.

Fig. 1 represents a double plunger sinking pump for use on lifts of from 150 to 200 ft. high, and in situations where gritty water renders the use of piston pumps undesirable. There are only two valves in the pump, and these are both very accessible. The water has a straight upward course through the suction valve, lower plunger, discharge valve, upper plunger, and out through the discharge opening. The plungers are worked by one of Deane's patent cylinders, so that both the up and the down strokes are controlable independently. These machines can be worked suspended on a chain so as to be readily lowered as the water is pumped down and raised out of the way when shots are fired.

Fig. 2 shows a double acting piston pump in use against moderate pressures, and where the water is not too gritty to render the use of a piston undesirable. Both the up and the down stroke is controlled separately, as in the first mentioned machine.

Fig. 3 illustrates the patent engine above alluded to, but mounted on a vertical standard. The cylinder can be swung from over the top of the shaft in a few minutes to allow of the rods being raised with facility. The piston rod can be connected to the ordinary wood spear rods driving the usual bucket or plunger pump, or it may be connected to a rod carried down the inside of rising main itself, as is usual when the engine is applied for driving Artesian well pumps. It will be observed that no counterbalance is necessary for steady and quiet working, but one may, of course, be employed if desired.

For many purposes the use of one of these vertical engines is recommended, as little fixing is required as compared with the use of pumps driven by an engine on the surface, whilst as compared to a horizontal direct-acting pump, the great convenience of having the engine in sight where it can be oiled and attended to is obtained, the plunger or bucket down the shaft requiring but little care. The Pulsometer Engineering Company are the makers of these pumps, and they have recently been awarded at Calcutta the only gold medal given for direct-acting pumps. At the offices in Queen Victoria-street, E.C., one of the vertical sinkers can be seen in motion, as also their well-known pulsometers.



Extra Treble Strong Wire Cloth and Perforated Metals in Steel, Iron, Copper, Brass, Zinc, Bronze.

Made in all Meshes and Widths.

N. GREENING & SONS, Limited,
Wire Manufacturers and Metal Perforators,
WARRINGTON.

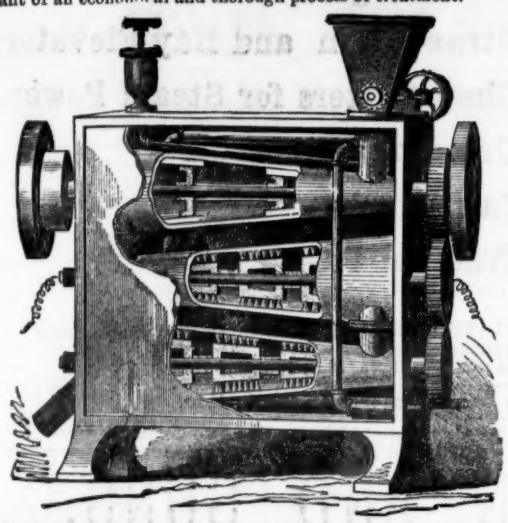
Jigger Bottoms, Trommels, Cylinder Covers, Riddles, Sieves for Diamond, Gold, Silver, Copper, Lead and Tin Mines.

Samples and Prices free on application.

NOVEL ELECTRO METALLURGICAL MACHINE.

PROFESSOR JAMES MANES AND SONS call the attention of miners, mineowners, capitalists, and others interested in the working of gold or silver mines to their new Electro Metallurgical Machine for extracting fine and rusty gold from sands or tailings of stamp mills, or the sands of hydraulic gold diggings, or from the black sands on the coast of Oregon or California, and other parts of the world where gold is found.

The problem that has long troubled the worker of free-milling gold and silver ores is a method to save the mineral now lost in the tailings of stamp mills or flumes. This alone, if it could be saved, would amount to many million dollars profit each year, besides enabling the working of much territory which is now lying idle for want of an economical and thorough process of treatment.



Prof. James Manes and Sons, of Denver, Colorado, U.S., have invented a machine (represented in the above engraving) which it is claimed will save nearly the entire amount of mineral which passes through it, the loss not being over 10 per cent., and in many cases not in excess of half that amount. The machine is a cheap and practical process—it never need stop for charging or cleaning up, being nearly self-acting. Steam, electricity, and mercury are used in the process of extracting the mineral.

This machine or amalgamator is adapted for free-milling gold or silver ores, or refractory after roasting. It consists of a series of three or more large cylinders, wider at one end than the other, placed one above the other in a horizontal position, a shaft or spindle running through the centre of each.

The ore and mercury are fed into the first cylinder, passing into the second, and then to the third. The first cylinder is furnished with steel mullers which nearly touch the sides of the cylinder, and revolve at a good rate of speed, mixing the mercury and ore. The second cylinder is furnished with large steel brushes attached to the shaft or spindle, revolving at a high rate of speed; through this a current of electricity is furnished by a Westinghouse dynamic electro machine, which materially assists in gathering the particles of very fine gold together, and thoroughly amalgamating the metal and mercury. The third cylinder is similarly furnished to the second; into this the amalgam passes, and is again acted upon and mixed by the brushes to catch any gold which might have escaped amalgamation in the second. A fourth cylinder may be used if found necessary.

The amalgamated pulp then passes through a revolving copper drum, plated with quicksilver inside. As the drum revolves it takes up the most part of the amalgamated gold. As the inside of the drum is constantly washed with a spray of water from perforated pipes fixed inside of said drum, a clean-plated surface is constantly brought in contact with the pulp or tailings as it passes out from the cylinders. After leaving the drum it falls down on to incline copper plates, the same as is now used in stamp mills.

The amalgam can be collected from the drum and plates without stopping the machine, and any live quicksilver that passes will be caught in syphons. The tailings are carried off with the water. The machine when attached to the flume will be driven by the waste water; it sifts the fine sands from the coarse gravel, and amalgamates it as above.

The specific points claimed by Prof. Manes and Sons in their patent are—

1.—The saving of almost all the mineral passing through the machine.

2.—The loss being less than 10 per cent.

3.—The entire absence of loss of the amalgamated material, thereby saving all the mercury, which, with the processes now in use, there is a large loss both of mercury and the precious metal.

4.—The small cost per ton at which the ore can be treated.

By the addition of the powerful current of electricity that passes off the revolving brushes, the most minute particles of gold will be caught and retained, which in the ordinary flume and stamps passes off with the water; this often amounts to a large percentage.

The inventors state that if English stock companies will give their assistance to work the black sands of Oregon and California by paying for the building of the machines, they will take a share of the gold for their services, or they will send their machines to any part of the world, or will sell patent rights to those desiring any of their patent machines or revolving furnaces for roasting or smelting ores, ball pulverisers, &c.

Prof. James Manes and Sons are agents for the Morey and Sparey Ball Pulveriser, that crushes and pulverises at the same time, and does as much work as eight stamps in a day, crushing either wet or dry.

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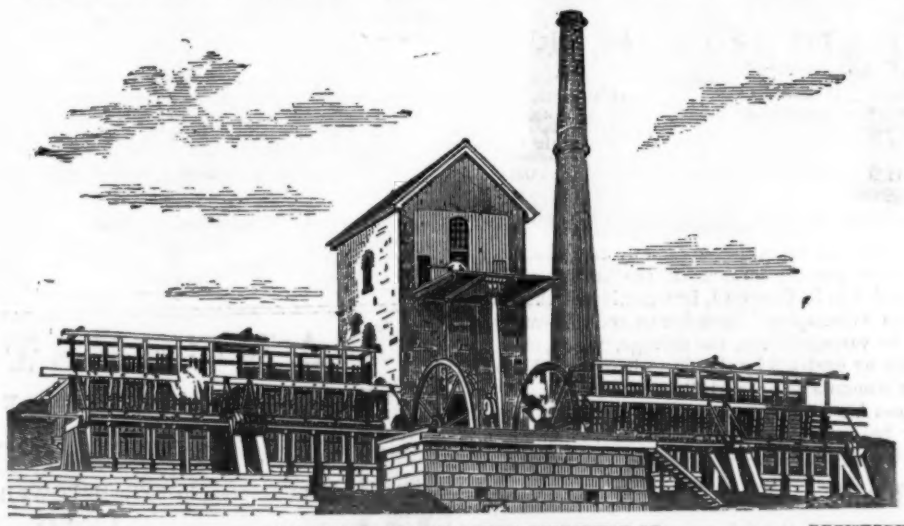

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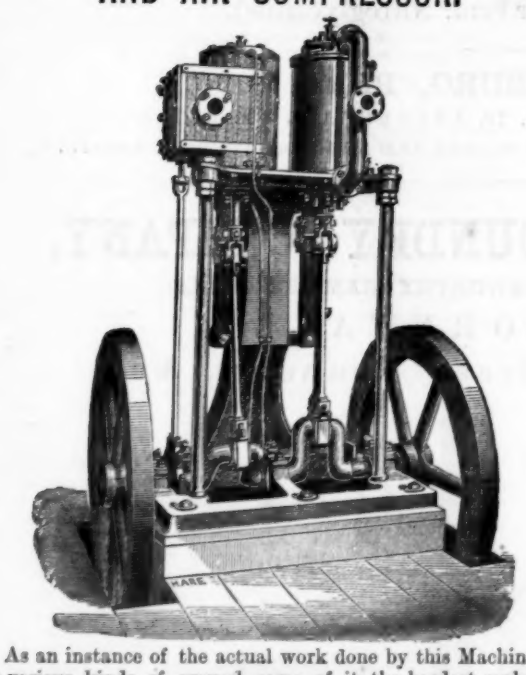

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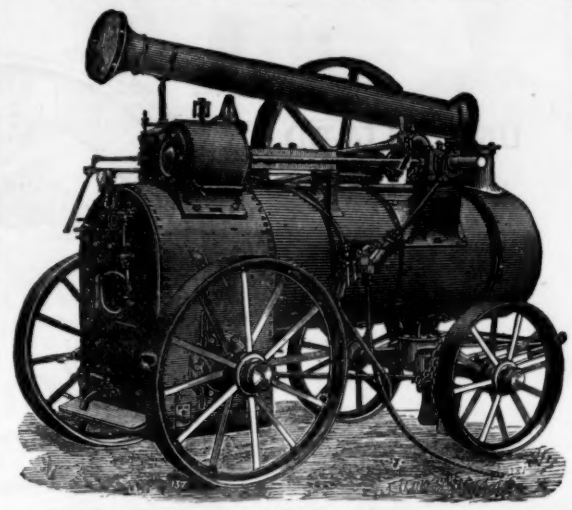

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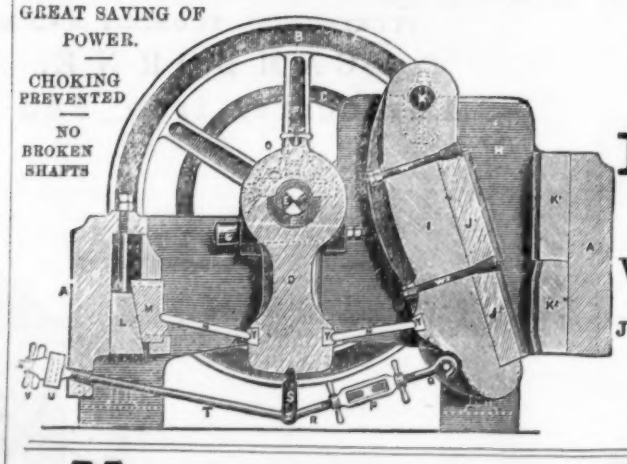

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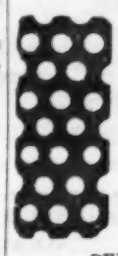

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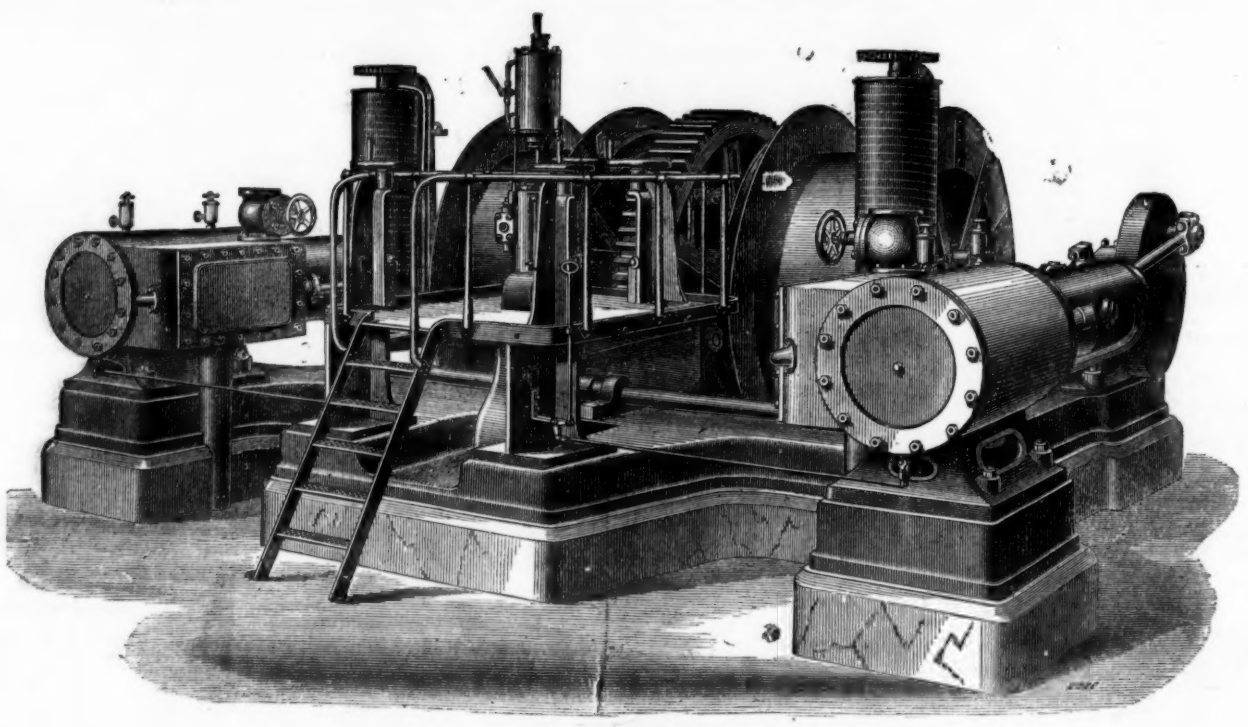

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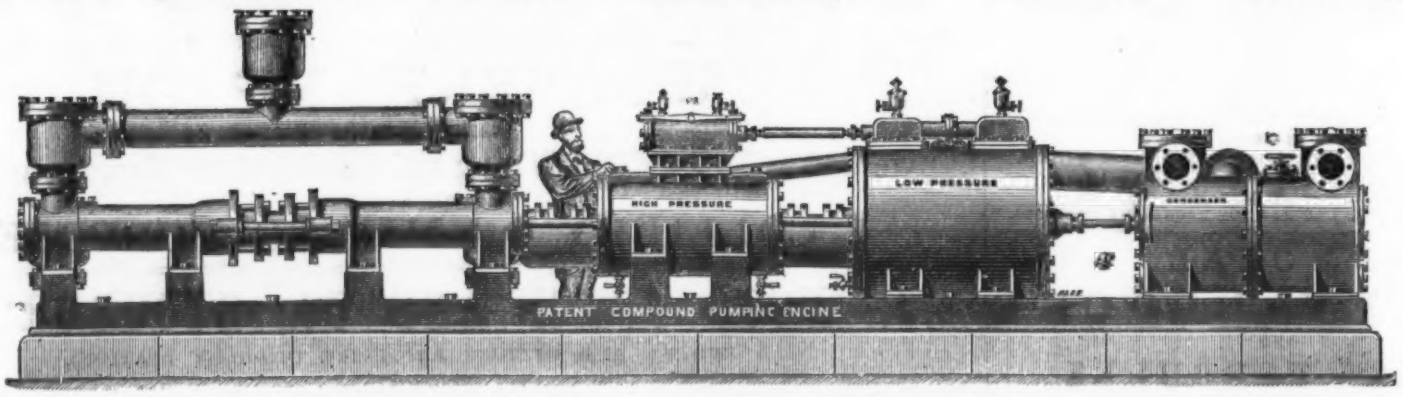

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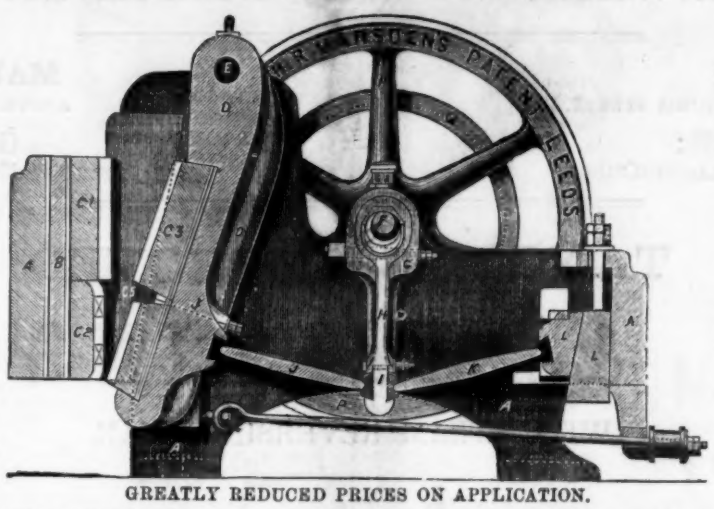

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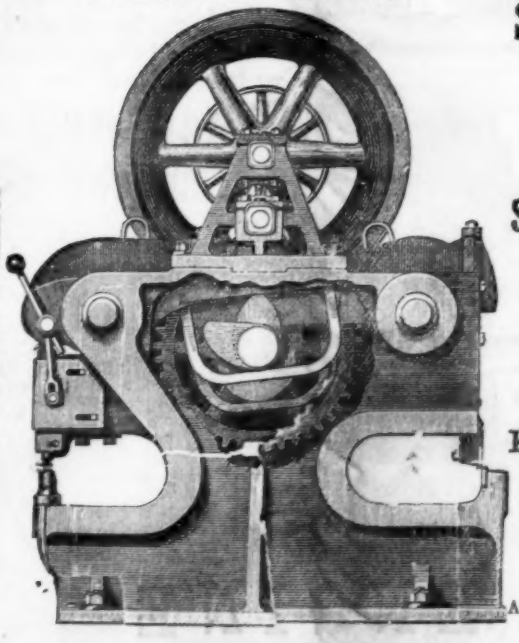

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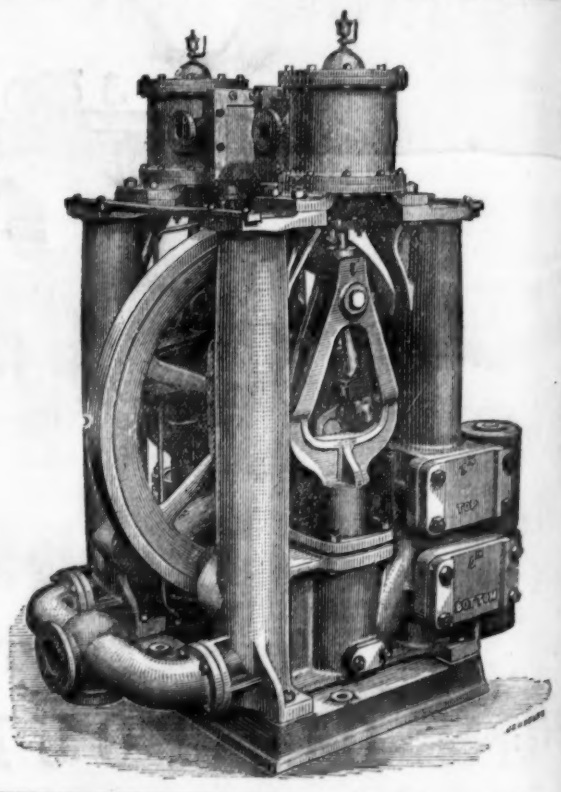

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